

Proceedings of the American Academy of Arts and Sciences.

VOL. XXXV. No. 27. — JUNE, 1900.

PROCEEDINGS OF THE ACADEMY, 1899-1900.

A TABLE OF ATOMIC WEIGHTS. BY THEODORE WILLIAM
RICHARDS.

REPORT OF THE COUNCIL: BIOGRAPHICAL NOTICES.

EPES SARGENT DIXWELL. BY CHARLES P. BOWDITCH.

JOHN CUMMINGS. BY WILLIAM H. NILES.

JOHN CODMAN ROPES. BY JOHN FISKE.

JOHN LOWELL. BY THORNTON K. LOTHROP.

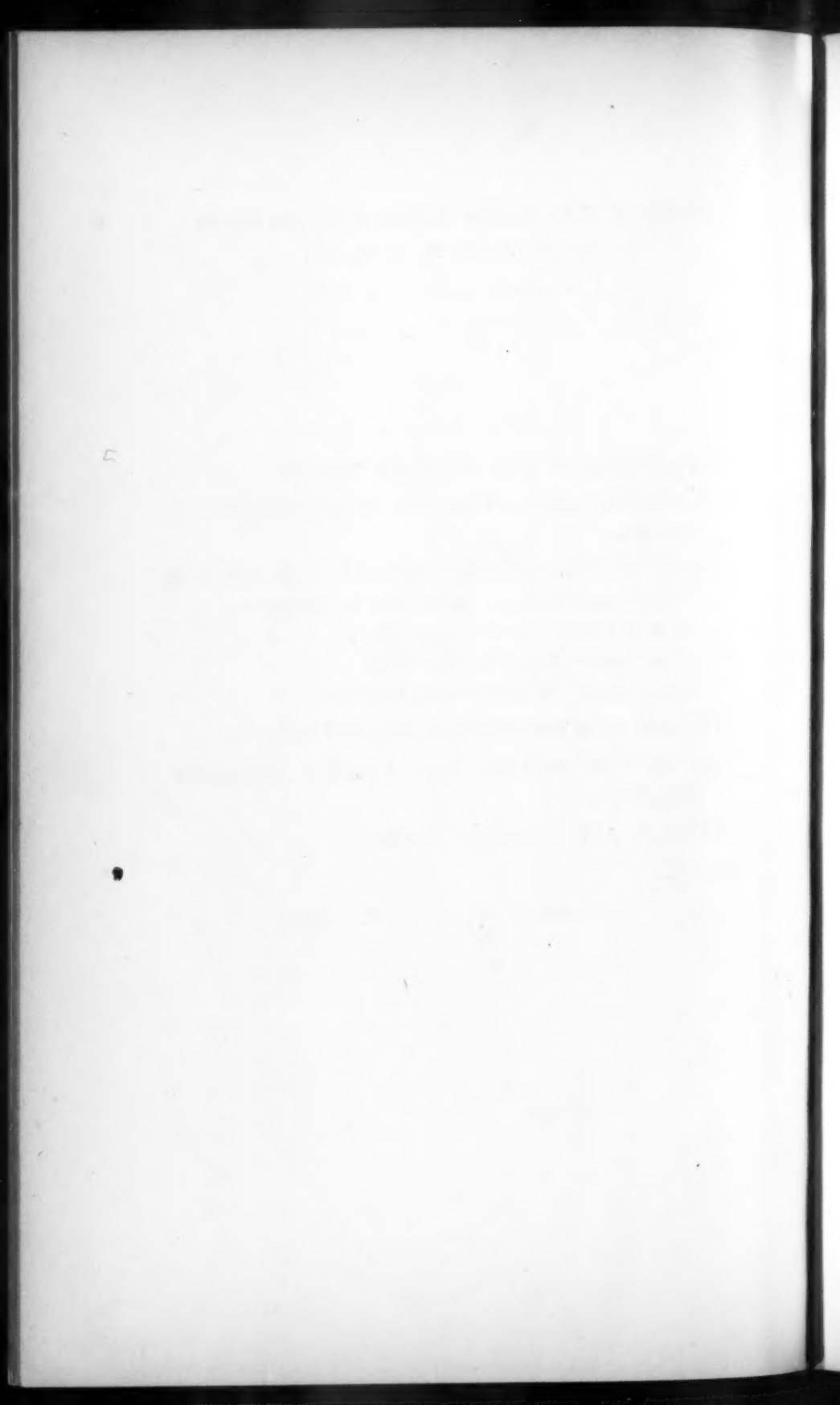
OFFICERS AND COMMITTEES FOR 1899-1900.

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PROCEEDINGS.

Nine hundred and eighth Meeting.

MAY 10, 1899. — ANNUAL MEETING.

VICE-PRESIDENT HYATT in the chair.

In the absence of the Recording Secretary, William E. Story was elected Recording Secretary *pro tempore*.

The Chair announced the death of Alvan Wentworth Chapman, of Appalachicola, Associate Fellow in Class II., Section 2.

The Corresponding Secretary read letters from Felipe Valle, announcing his appointment as Director of the Astronomical Observatory of Tacubaya; from Angel Anguiano, announcing his appointment as Director of the Mexican Geodetic Commission; from the Geographical Society of Madrid, announcing the death of its President, Francisco Coello de Portugal y Quesada; from H. P. Talbot and O. F. Wadsworth, accepting Fellowship in the Academy; from Charles D. Walcott, acknowledging his election as Associate Fellow; and from Oliver Heaviside, acknowledging his election as Foreign Honorary Member. A letter from the University of Cambridge inviting the Academy to appoint a delegate to the jubilee of Sir George Gabriel Stokes, Bart., in June, 1899, was read, and, on motion of Charles R. Cross, it was

Voted, That the President and Corresponding Secretary send a letter of congratulation to Sir George G. Stokes.

A letter from the Commission on Atomic Weights of the German Chemical Society, inviting "Chemical Societies and similar Institutions of all countries to assist in the formation of an International Commission," was read, and, on motion of the Corresponding Secretary, it was

Voted, That a committee of three be appointed to represent the Academy in the International Commission on Atomic Weights. The Chair appointed Theodore W. Richards, Wolcott Gibbs, and Ira Remsen members of this committee.

The Corresponding Secretary announced that the Committee to select a delegate to the International Congress of Orientalists at Rome in October next had appointed Charles Rockwell Lanman of Cambridge, and that he had accepted.

The Corresponding Secretary read the report of the Council.*

The Treasurer presented his annual report of which the following is an abstract:—

GENERAL FUND.

Receipts.

Balance, April 30, 1898		\$3,481.95
Assessments	\$990.00	
Sale of publications	48.52	\$1,038.52
Income from investments		4,850.63
Return of bank tax		45.00
Donations	105.00	6,039.15
		<u>\$9,521.10</u>

Expenditures.

General expenses	\$2,023.69	
Library expenses	1,559.70	
Publishing expenses	2,071.95	\$5,655.34
Investments		3,833.15
Balance, April 29, 1899		32.61
		<u>\$9,521.10</u>

RUMFORD FUND.

Receipts.

Balance, April 30, 1898	\$1,778.44
Income	2,266.03
Return of bank tax	93.53
Return of Investment	1,034.99
	<u>\$5,172.99</u>

* See Proceedings, XXXIV. p. 639.

Expenditures.

Books	\$57.01	
Publishing	790.88	
Investigations	400.00	
Rent	10.00	\$1,257.89
Balance, April 29, 1899		<u>3,915.10</u>
		\$5,172.99

WARREN FUND.

Receipts.

Balance, April 30, 1898	\$925.95
Income	853.48
	<u>\$1,779.43</u>

Expenditures.

Investigations	\$630.00
Balance, April 29, 1899	1,149.43
	<u>\$1,779.43</u>

BUILDING FUND.

Receipts.

Balance, April 30, 1898	\$1,268.14
Income	504.83
	<u>\$1,772.97</u>

Expenditures.

Investment	\$1,466.94
Balance, April 29, 1899	306.03
	<u>\$1,772.97</u>

The annual report of the Librarian was presented and showed that 3284 books and pamphlets had been added to the Library during the year, of which 2432 were obtained by gift and exchange and 852 purchased, and 317 volumes were bound at an expense of \$419.70. The total expenditure for books, periodicals, and binding amounted to \$1004.17. There were borrowed 235 books by 30 persons, of whom 18 were Fellows of the Academy.

The following reports were also presented:—

REPORT OF THE RUMFORD COMMITTEE.

BOSTON, May 10, 1899.

During the past year the Rumford Committee has made the following appropriations from the fund of \$1000 placed at its disposition at the last Annual Meeting, for the furtherance of researches in light and heat.

To Professor Theodore W. Richards of Harvard University, \$200 for the construction of a micro-kinetoscope, the immediate application of which is to be the study of the birth and growth of crystals.

To Professor W. C. Sabine of Harvard University, \$200 for the continuation of his researches on the wave-lengths of ultra-violet radiations.

To Professor Henry Crew of the Northwestern University, a sum not exceeding \$200 for the continuation of his researches upon the spectrum of the electric arc.

To Professor Arthur G. Webster of Clark University, \$200 for a research upon the distribution of energy in various spectra by means of the Michelson interferometer and the radiometer.

At a meeting held on April 12, 1899, it was voted that the Committee recommend to the Academy that the volumes necessary to complete the set of the "Fortschritte der Physik" in the library of the Academy, be purchased from the Rumford Fund.

At the same meeting it was also voted that the Committee recommend to the Academy the appropriation of one hundred and twenty dollars from the Rumford Fund for the purchase and binding of the usual periodicals of the current fiscal year.

At a meeting held on May 3, 1899, it was voted that the Academy be asked to make the usual appropriation of \$1000, at the Annual Meeting, to be expended at the discretion of the Committee in furtherance of research.

At the April meeting of the Committee it was voted for the first time, "that the Rumford Committee recommend to the Academy the award of the Rumford Medal to Mr. Charles F. Brush, for the Practical Development of Electric Arc Lighting." At the May meeting of the Committee the same resolution was voted for the second time.

In order to ascertain the stage of advancement of the various researches in aid of which appropriations have been granted from the Rumford Fund, a request for information was sent to such grantees as were understood not to have made a final report, together with the following extracts from the records of the Committee:—

Nov. 10, 1897. "It was voted that, in future, recipients of grants for

investigations be requested to make a report annually as to the state of the work for which the grant was made."

June 8, 1898. "It was voted that in the judgment of the Committee, persons carrying on researches with the aid of the Rumford Fund should submit to the Academy an account of their researches not less complete than that published elsewhere. These researches may be published in any place or form, with the proviso that due recognition be made of the grant, and the presentation of the paper to the Academy."

In answer to this request, reports have been received of which the following are summaries:—

Professor Henry Crew has published a paper "On the Sources of Luminosity in the Electric Arc" in the Proceedings of the Academy for June, 1898. He expects to continue the prosecution of his research during the coming summer with the aid of the further appropriation made by the Rumford Committee for that purpose.

Professor B. O. Peirce reports that a continuation of his work upon the thermal conductivity of poor conductors is in progress, the substance vulcanite being at present a particular subject of study. An extended paper "On Thermal Conductivities of Certain Poor Conductors" was published in the Proceedings of the Academy for August, 1898.

Professor E. H. Hall is pursuing his studies upon the thermal conductivity of wrought iron, having published in the Proceedings for February, 1899, a paper "On the Thermal Conductivity of Cast Iron."

Professor Edward L. Nichols reports that his research upon the radiation from carbon at high temperatures is making good progress. The study of the acetylene flame as a standard of light, the calibration of thermo-elements, and the application of the platinum-rhodium thermo-element to the determination of the actual temperature of the carbon, have occupied much time. Measurements with the spectro-photometer are now in progress upon the visible radiations from carbon rods as compared with those of like character with the acetylene flame. A study of the distribution of energy in the spectrum of the acetylene flame and in that of incandescent carbon will follow.

Professor W. C. Sabine says with regard to his investigation upon the study of very short light waves: "In order to explain the advance which he has made [Mr. Theodore Lyman, who has made the actual measurements], it will be necessary to refer to the work of Schumann. This work was done with a fluorite prism, and wave lengths were found by extrapolation, the statement being made that speculum metal would not reflect the shorter waves. Mr. Lyman has been using a concave grating

with success, and has got as low as wave length 900 tenth-meters, Schumann's estimated limit being 1000. The latter worked entirely with the spectra of gases, and stated that he could not go below wave length 1600 for metals."

Professor George E. Hale states that the spectro-heliograph, in the construction of which he has been aided by a grant from the Rumford Fund, is approaching completion. He writes that "devices have been introduced whereby photographs of prominences or faculae can be taken simultaneously in two different lines of the spectrum. In the case of eruptive prominences the comparison of photographs made in this way may prove to be instructive."

Professor Theodore W. Richards states that he has begun his investigation of the birth and growth of crystals as studied by the micro-kinetoscope, and has already obtained various excellent photographs illustrating these phenomena, which also give promise of interesting results as to the rate of growth of different crystals.

CHARLES R. CROSS, *Chairman.*

REPORT OF THE C. M. WARREN COMMITTEE.

10 May, 1899.

At the last Annual Meeting of the Academy the sum of \$600 from the income of the Warren Fund, was granted to Professor C. F. Mabery, of Cleveland, Ohio, in furtherance of his researches on petroleum. Several papers explanatory of Professor Mabery's results have been published during the year; and it is well understood that his work is being prosecuted all the while with ardor and success.

A research by Professor F. C. Phillips, of Allegheny City, in aid of which a grant of \$200 was made in 1896, has been in so far completed that an account of it was published, in November last, in the Proceedings of the Academy, under the title "On Fluctuations in the Composition of Natural Gas."

A grant in the sum of \$200 made to Professor H. O. Hofman, of Boston, in 1897, and supplemented in 1898 by an additional grant of \$30, has also borne good fruit. Professor Hofman's subject was "The Fusibility of Slags." He has explained to me that interesting and important results have been obtained, which he intends to publish in the near future.

F. H. STORER, *Chairman.*

REPORT OF THE COMMITTEE OF PUBLICATION.

BOSTON, May 10, 1899.

The Publishing Committee begs leave to report that there have been issued during the last academic year ten numbers of Vol. XXXIII. and the first twenty numbers of Vol. XXXIV. of the Proceedings, aggregating 796 pages and 17 plates; besides one number of Vol. XII. of the Memoirs containing 36 pages and 7 plates. Five numbers of the Proceedings have been printed at the cost of the Rumford Fund. The expenditure for the remaining publications was \$2334.14. The appropriation from the General Fund was \$2500 and the sales \$48.52, making a sum available for publication of \$2548.52, and leaving therefore an unexpended balance of \$214.38. The Academy has never before published so many pages in a single year.

SAMUEL H. SCUDDER, *Chairman.*

On the recommendation of the Committee of Finance, it was *Voted*, To make the following appropriations from the income of the General Fund for the ensuing year:—

For general expenses	\$2000
For the library	1500
For publishing	2400

Voted, That the assessment for the ensuing year be five dollars.

Voted, That the Treasurer be authorized to pay from the funds of the Academy any bills approved by the Librarian incurred on account of the expense of moving the library.

On the recommendation of the Rumford Committee, it was

Voted, That the sum of one thousand dollars (\$1000) from the income of the Rumford Fund be placed at the disposal of the Rumford Committee to be expended in aid of investigations on Light and Heat, payments to be made on the order of the Chairman of the Committee.

Voted, That the volumes necessary to complete the set of the "Fortschritte der Physik" in the library be purchased at the expense of the income of the Rumford Fund; also, that one hundred and twenty dollars (\$120) be appropriated from the

income of the Rumford Fund for the purchase and binding of periodicals.

On the recommendation of the C. M. Warren Committee, it was

Voted, That the sum of six hundred dollars (\$600) from the income of the Warren Fund be granted to Charles F. Mabery, of Cleveland, Ohio, in aid of his researches on the chemistry of petroleum.

In accordance with the recommendation of the Rumford Committee, it was

Voted, To award the Rumford Premium to Charles F. Brush for the practical development of electric arc lighting.

The annual election resulted in the choice of the following officers and committees:—

ALEXANDER AGASSIZ, *President*.

JOHN TROWBRIDGE, *Vice-President for Class I.*

ALPHEUS HYATT, *Vice-President for Class II.*

AUGUSTUS LOWELL, *Vice-President for Class III.*

SAMUEL H. SCUDDER, *Corresponding Secretary.*

WILLIAM WATSON, *Recording Secretary.*

FRANCIS BLAKE, *Treasurer.*

A. LAWRENCE ROTCH, *Librarian.*

Councillors.

HENRY TABER,	} of Class I.
THEODORE W. RICHARDS,	
HARRY M. GOODWIN,	

BENJAMIN L. ROBINSON,	} of Class II.
WILLIAM T. COUNCILMAN,	
JOHN E. WOLFF,	

BARRETT WENDELL,	} of Class III.
EDWARD ROBINSON,	
JAMES B. AMES,	

Member of the Committee of Finance.

AUGUSTUS LOWELL.

Rumford Committee.

ERASMUS D. LEAVITT, AMOS E. DOLBEAR,
 EDWARD C. PICKERING, ARTHUR G. WEBSTER,
 CHARLES R. CROSS, THEODORE W. RICHARDS,
 THOMAS C. MENDENHALL.

C. M. Warren Committee.

FRANCIS H. STORER, HENRY B. HILL,
 CHARLES L. JACKSON, LEONARD P. KINNICUTT,
 SAMUEL CABOT, ARTHUR M. COMEY,
 ROBERT H. RICHARDS.

The Chair appointed the following standing committees: —

Committee of Publication.

SAMUEL H. SCUDDER, SETH C. CHANDLER,
 CRAWFORD H. TOY.

Committee on the Library.

A. LAWRENCE ROTCH, HENRY W. HAYNES,
 SAMUEL HENSHAW.

Auditing Committee.

JOHN C. ROPES, ELIOT C. CLARKE.

The following gentlemen were elected members of the Academy: —

William Elwood Byerly, of Cambridge, to be a Resident Fellow in Class I., Section 1 (Mathematics and Astronomy).

William Henry Pickering, of Cambridge, to be a Resident Fellow in Class I., Section 1.

Henry Lefavour, of Williamstown, to be a Resident Fellow in Class I., Section 2 (Physics).

Charles Russell, Baron Russell of Killowen, of Tadworth, to be a Foreign Honorary Member in Class III., Section 1 (Philosophy and Jurisprudence).

The following papers were presented by title :—

On the Thermal Conductivity of Vulcanite. By B. O. Peirce.
Ferrous Iodide. By C. Loring Jackson and Ira H. Derby.

Nine hundred and ninth Meeting.

JUNE 14, 1899.

The PRESIDENT in the chair.

The Corresponding Secretary read letters from W. E. Byerly and W. H. Pickering, accepting Fellowship, and from Lord Russell of Killowen, acknowledging his election as Foreign Honorary Member. Letters from Marion T. Hosmer, soliciting a subscription on behalf of the Rumford Historical Society, and from the University of Pennsylvania, the American Philosophical Society, and other Philadelphia Societies, inviting attendance at the presentation of the Franklin statue, were referred to the Corresponding Secretary.

The Chair announced the death of Francis Minot, Resident Fellow in Class II., Section 4, and of Manning Ferguson Force, Associate Fellow in Class III., Section 3.

The Rumford Medal awarded to James Edward Keeler at the annual meeting of 1898 was presented, Edward C. Pickering acting as Professor Keeler's proxy.

The President spoke of the proposed exploring expedition to the mid-Pacific under his direction, the United States Commission of Fish and Fisheries having placed the Albatross at his disposal. The vessel will be thoroughly equipped with the newest apparatus for deep-sea investigations, and special appliances will be constructed for use in very deep water. The expedition will leave San Francisco about the middle of August for Tahiti, in the Society Islands, which will be the headquarters during the six or eight weeks required for exploration of the Paumotu Islands. Afterwards a week or ten days will be spent among the Tonga or Friendly Islands, and the expedition will then proceed to the Fiji Islands, where a short stay will be made. After visiting some of the Ellis and Gilbert Islands, six or seven weeks will be devoted to the exploration of the Mar-

shall Islands. Between these islands and the Hawaiian Islands, and between the latter and San Francisco, a distance of four thousand miles, a line of deep-sea dredgings will be run, deep-sea tow-nets being used while the dredging is going on. The Albatross is expected to return to the United States in April next.

The following papers were presented by title: —

The Development and Application of a General Equation for Free Energy and Physico-chemical Equilibrium. By Gilbert Newton Lewis. Presented by T. W. Richards.

The Electro-chemical Equivalents of Copper and Silver. By T. W. Richards, E. Collins, and G. W. Heimrod.

A Revision of the Atomic Weight of Calcium. By T. W. Richards.

Short Studies of North American Tryxalinae. By Samuel H. Scudder.

The Recording Secretary read the agreement with the Massachusetts Historical Society in regard to quarters for the Academy in the new building of the Society. Remarks on this subject were made by the President and Augustus Lowell.

Nine hundred and tenth Meeting.

OCTOBER 11, 1899. — STATED MEETING.

The Academy met at Ellis Hall.

VICE-PRESIDENT HYATT in the chair.

The Corresponding Secretary read letters from Henry Lefavour, accepting Fellowship in the Academy; from the Royal Academy of Sciences of Turin, announcing the death of Professor Cesare Nani; from the National Society of Horticulture of France, announcing the death of its first Vice-President, Henri Lévêque de Vilmorin; from the Students' Union at the Polytechnic School at Zurich, inviting attendance at the twenty-fifth jubilee of Professor A. Heim; from Captain Constantin Edler von Pott, announcing his appointment as Director of the Hydrographic Bureau of the Imperial and Royal Navy at Pola; and from Charles R. Lanman, reporting his inability

to represent the Academy at the International Congress of Orientalists. A letter from the Secretary of the organizing committee of the International Congress of Physics at Paris in 1900, enclosing a prospectus and requesting that it be brought to the notice of members, was referred to the members of the Council from Class I.

The Corresponding Secretary reported that, in response to letters of invitation received during the summer, the President had appointed George P. Fisher, Associate Fellow, as a delegate to the celebration of the one hundredth anniversary of the Connecticut Academy of Arts and Sciences, and Vice-President Trowbridge had appointed T. C. Mendenhall, Resident Fellow, to represent the Academy at the celebration of the seventy-fifth anniversary of the founding of the Franklin Institute.

The Chair announced the death of John Harrison Blake, of Boston, Resident Fellow in Class I., Section 2; and of Robert Wilhelm Bunsen, of Heidelberg, Foreign Honorary Member in Class I., Section 3.

On the motion of the Corresponding Secretary, a quorum for business not being present, it was

Voted, To meet on adjournment on the second Wednesday in November.

Arthur G. Webster read and explained a paper presented by A. A. Michelson on the Echelon Spectroscope.

The following papers were read by title:—

Peripheral Distribution of the Cranial Nerves of *Spelerpes bilineatus*. By Mary A. Bowers. Presented by E. L. Mark.

Note on the Finite Continuous Groups of the Plane. By F. B. Williams. Presented by Henry Taber.

Two Genera of North American Decticinae. By S. H. Seudder.

Nine hundred and eleventh Meeting.

NOVEMBER 8, 1899. — ADJOURNED STATED MEETING.

In the absence of the regular presiding officers, HENRY P. BOWDITCH was chosen President *pro tempore*.

The Chair announced the death of John Codman Ropes, Resident Fellow in Class III., Section 3.

Samuel H. Scudder tendered his resignation as Corresponding Secretary, to take effect in January, and it was accepted.

The Chair appointed from the next retiring Councillors

THEODORE W. RICHARDS, of Class I.,

BENJAMIN L. ROBINSON, of Class II.,

BARRETT WENDELL, of Class III.,

a committee to nominate a candidate for the office of Corresponding Secretary.

On the motion of the chairman of the C. M. Warren Committee, it was

Voted, To grant permission to H. O. Hofman to publish in the Transactions of the American Institute of Mining Engineers or elsewhere the results of his research, for which aid was granted by the Academy from the C. M. Warren Fund.

On the motion of the Librarian, it was

Voted, To authorize the expenditure of a sum not exceeding two hundred dollars (\$200) for furniture for the Library.

The following gentlemen were elected members of the Academy:—

Maxime Bôcher, of Cambridge, to be a Resident Fellow in Class I., Section 1 (Mathematics and Astronomy).

William Fogg Osgood, of Cambridge, to be a Resident Fellow in Class I., Section 1.

John Singer Sargent, of London, to be an Associate Fellow in Class III., Section 4 (Literature and the Fine Arts).

Sir Benjamin Baker, of London, to be a Foreign Honorary Member in Class I., Section 4 (Technology and Engineering), in place of the late Sir Henry Bessemer.

Rudyard Kipling, of Rottingdean, to be a Foreign Honorary Member in Class III., Section 4 (Literature and the Fine Arts).

Arthur G. Webster described Maxwell's electric top and exhibited it in operation.

The following papers were presented by title:—

Contributions from the Cryptogamic Laboratory of Harvard

University, XLI. Preliminary Diagnoses of New Species of Laboulbeniaceae.—I. By Roland Thaxter.

Note on the Chief Theorem of Lie's Theory of Continuous Groups. By S. E. Slocum. Presented by Henry Taber.

Nine hundred and twelfth Meeting.

DECEMBER 13, 1899.

The CORRESPONDING SECRETARY in the chair.

Letters were received from the Royal Academy of Sciences of Turin, announcing the death of Domenico Perrero; from the International Congress of Ethnographical Sciences, enclosing programmes and an invitation to attend its meetings at Paris during the summer of 1900; from Maxime Bôcher, John S. Sargent, and Rudyard Kipling, accepting membership.

A letter was read from the Royal Prussian Academy of Sciences of Berlin, announcing the celebration of the two hundredth anniversary of its foundation on the 19th and 20th of March, 1900, and inviting the American Academy to send delegates. It was accordingly

Voted, To appoint John Williams White and John Eliot Wolff, delegates to this celebration.

The chair announced the death of Epes Sargent Dixwell, Resident Fellow in Class III, Section 2.

The following papers were read:—

Experimental and Statistical Studies on the Influence of Cold on the Bacillus of Typhoid Fever and its Distribution; with special Reference to Ice Supply and the Public Health. By William T. Sedgwick and Charles-Edward A. Winslow.

The Electrical Resistance of the Human Body. By William L. Hooper.

The following papers were presented by title:—

A Revision of the Atomic Weight of Iron. By T. W. Richards and C. P. Baxter.

Note on the Constitution of Diparabrombenzylecyanamide. By C. Loring Jackson and R. W. Faller.

On Certain Colored Substances Derived from Nitro Compounds. Third paper. By C. Loring Jackson and F. H. Gazzolo.

Certain Derivatives of Metadibrombenzyl. By C. Loring Jackson and W. P. Cohoe.

Nine hundred and thirteenth Meeting.

JANUARY 10, 1900. — STATED MEETING.

VICE-PRESIDENT HYATT in the chair.

The Corresponding Secretary read letters from Sir B. Baker and William Fogg Osgood, acknowledging election. He also read circulars from the Royal Academy of Sciences of Turin, announcing the terms of award of the Vallauri prizes, and from the International Congress of Comparative History and the International Congress of Horticulture, Arboriculture, and Pomology, enclosing programmes.

A letter was received from Seabury C. Mastick, Secretary of the committee on the modification of the Federal Legacy Tax, enclosing a petition setting forth the desired modification of the law. On the motion of William E. Story, it was

Voted, That the Acting President be instructed to sign this petition on behalf of the Academy.

The Chair announced the following deaths: —

Sir John William Dawson, of Montreal, Associate Fellow in Class II., Section I.

William Alexander Hammond, of Washington, Associate Fellow in Class II., Section 4.

Sir James Paget, Bart., of London, Foreign Honorary Member in Class II., Section 4.

The vacancy occasioned by the resignation of Samuel H. Scudder was filled by the election of

WILLIAM M. DAVIS, *Corresponding Secretary*.

On the motion of Augustus Lowell, it was

Voted, That the thanks of the Academy be tendered to

Samuel Hubbard Scudder for his faithful and efficient services as Corresponding Secretary.

The following gentlemen were elected members of the Academy:—

James Mason Crafts, of Boston, as Resident Fellow in Class I., Section 3 (Chemistry).

Joseph Hodges Choate, of New York, as Associate Fellow in Class III., Section 1 (Philosophy and Jurisprudence), in place of the late Thomas McIntyre Cooley.

William Wirt Howe, of New Orleans, as Associate Fellow in Class III., Section 1.

William Mitchell, of Saint Paul, as Associate Fellow in Class III., Section 1, in place of the late Ezekiel Gilman Robinson.

Sir George Otto Trevelyan, Bart., of London, as Foreign Honorary Member in Class III., Section 3 (Political Economy and History).

The vacancies in the Auditing Committee occasioned by the resignation of Eliot C. Clarke and the death of John C. Ropes were filled by the appointment of the following

Auditing Committee:

HENRY G. DENNY,

WILLIAM L. RICHARDSON.

On the recommendation of the Rumford Committee, it was *Voted*, That the Academy appropriate one hundred dollars (\$100) to Theodore W. Richards for the prosecution of a research on the transition point of crystallized salts.

Voted, That the Treasurer be authorized to make arrangements for the sale to the public of the Life and Works of Count Rumford.

John S. Kingsley read a paper entitled "The Ancestry of the Mammalia."

The following papers were presented by title:—

Contributions from the Gray Herbarium of Harvard University. New Series.—No. XVIII.

I. New Species and Varieties of Mexican Plants. By J. M. Greenman.

- II. Synopses of the Genera *Jaegeria* and *Russelia*. By B. L. Robinson.
- III. New *Dioscoreas* from Mexico. By E. B. Uline.
- IV. New *Phanerogams* chiefly *Gamopetalae* from Mexico and Central America. By B. L. Robinson.

Nine hundred and fourteenth Meeting.

February 14, 1900.

In the absence of the regular presiding officers, SAMUEL H. SCUDDER acted as President *pro tempore*.

The chair announced the death of the following Foreign Honorary Members:—

James Martineau, of London, Class III., Section 1.

Carl Friedrich Rammelsberg, of Berlin, Class II., Section 1.

John Ruskin, of Coniston, Class III., Section 4.

The following letters were received: from Mathilde Rammelsberg, announcing the death of Carl Friedrich Rammelsberg, Foreign Honorary Member of the Academy in Class II., Section 1; from W. M. Davis, accepting his election as Corresponding Secretary; from John Williams White, accepting his appointment as Delegate to the celebration of the 200th anniversary of the foundation of the Royal Prussian Academy of Sciences.

The following papers were presented by title:—

The Metamerism of the Hirudinea. By W. E. Castle. Presented by E. L. Mark.

The Freshwater Tertiary Formations of the Rocky Mountain region. By W. M. Davis.

On the Determination of Sulphuric Acid in the Presence of Iron: a Note on Solid Solutions. By Theodore William Richards.

The Species of the Orthopteran Genus *Derotmema*. By Samuel H. Scudder.

Crawford H. Toy gave an informal account of a new theory of totemism.

Nine hundred and fifteenth Meeting.

March 14, 1900 — STATED MEETING.

The Academy met, by invitation of John E. Hudson, at the Algonquin Club.

VICE-PRESIDENT TROWBRIDGE in the chair.

The Corresponding Secretary read letters from Joseph H. Choate and Sir G. O. Trevelyan acknowledging their election into the Academy. He also exhibited a bronze copy of the medal struck in honor of Sir George G. Stokes's Jubilee in 1899, presented to the Academy by the University of Cambridge.

On motion of the Recording Secretary, it was

Voted, To meet, on adjournment, on the second Wednesday in April.

The following gentlemen were elected members of the Academy:—

Arlo Bates, of Boston, to be a Resident Fellow in Class III., Section 4 (Literature and the Fine Arts).

Liberty Hyde Bailey, of Ithaca, to be an Associate Fellow in Class II., Section 2 (Botany), in place of the late Alvan Wentworth Chapman.

Friedrich Kohlrausch, of Berlin, to be a Foreign Honorary Member in Class I., Section 2 (Physics).

The Chair appointed the following Councillors to act as Nominating Committee:—

THEODORE W. RICHARDS, of Class I.,
BENJAMIN L. ROBINSON, of Class II.,
BARRETT WENDELL, of Class III.

At the request of the Chair, Charles R. Cross, Chairman of the Rumford Committee, stated the grounds for the award of the Rumford Premium to Charles F. Brush for his researches in electric arc lighting.

The Acting President then presented the medal to Mr. Brush, who, in response, gave an account of his early experiments in electricity.

Elihu Thomson described new electric apparatus for high

potentials, and exhibited an improved form of his dynamo-electric machine.

The following papers were presented by title : —

View of the Carboniferous Fauna of the Narragansett Basin.
By A. S. Packard.

Contributions from the Gray Herbarium of Harvard University. New Series. — No. XIX. By M. L. Fernald. Presented by B. L. Robinson.

- I. Synopsis of the Mexican and Central American Species of *Salvia*.
- II. Revision of the Mexican and Central American Solanums of the Subsection *Torvaria*.
- III. Some Undescribed Mexican Phanerogams, chiefly Labiatae and Solanaceae.

Historical Notes relating to Musical Pitch in the United States. By Charles R. Cross.

Nine hundred and sixteenth Meeting.

APRIL 11, 1900. — ADJOURNED STATED MEETING.

The PRESIDENT in the chair.

The Chair announced the following deaths : —

Silas Whitcomb Holman, Resident Fellow in Class I., Section 2.

Edward John Phelps, Associate Fellow in Class III., Section 3.

The Rumford Committee made a preliminary announcement that it would recommend, at the next annual meeting, the award of the Rumford Premium to Carl Barus, of Providence.

The following motion was offered by W. E. Story : —

That a committee consisting of the President and two others selected by him be appointed to consider the propriety of amending the first section of Chapter I. of the Statutes, with reference to the classification of the Fellows and Foreign Honorary Members.

The following recommendation was offered by the Rumford Committee : —

The Rumford Committee recommends that the Academy

appropriate the sum of two hundred and fifty dollars (\$250) from the income of the Rumford Fund to Arthur L. Clark, of Worcester, to aid in the prosecution of researches on the properties of vapors near the critical point.

W. M. Davis read a paper entitled "The Freshwater Tertiary Formations of the Rocky Mountain Region."

The following papers were presented by title: —

Contributions from the Cryptogamic Laboratory of Harvard University XLII.: Preliminary Diagnoses of New Species of Laboulbeniaceæ. — II. By Roland Thaxter.

The Driving Energy of Physico-chemical Reaction and its Temperature Coefficient. By Theodore W. Richards.

Supplementary Note on the Chief Theorem of Lie's Theory of Finite Continuous Groups. By Stephen Elmer Slocum. Presented by Henry Taber.

On the Singular Transformations of Groups generated by Infinitesimal Transformations. By Henry Taber.

A TABLE OF ATOMIC WEIGHTS

OF SEVENTY-FOUR ELEMENTS.

Compiled in April, 1900, from the most Recent Data.

By THEODORE WILLIAM RICHARDS.

Name.	Symbol.	Atomic Weight.	Name.	Symbol.	Atomic Weight.
Aluminium . .	Al	27.1	Molybdenum . .	Mo	96.0
Antimony . .	Sb	120.0	Neodymium . .	Nd	143.6
Argon	A	39.9 ?	Nickel	Ni	58.70
Arsenic	As	75.0	Niobium	Nb = Cb	94.
Barium	Ba	137.43	Nitrogen	N	14.04
Beryllium . . .	Be = Gl	9.1	Osmium	Os	190.8
Bismuth	Bi	208.	Oxygen (standard)	O	16.000
Boron	B	11.0	Palladium . . .	Pd	106.5
Bromine	Br	79.955	Phosphorus . . .	P	31.0
Cadmium	Cd	112.3	Platinum	Pt	195.2
Cæsium	Cs	132.9	Potassium	K	39.14
Calcium	Ca	40.1	Praseodymium . .	Pr	140.5
Carbon	C	12.001	Rhodium	Rh	103.0
Cerium	Ce	140.	Rubidium	Rb	85.44
Chlorine	Cl	35.455	Ruthenium . . .	Ru	101.7
Chromium	Cr	52.14	Samarium ? . . .	Sm	150.
Cobalt	Co	59.00	Scandium	Sc	44.
Columbium . . .	Cb = Nb	94.	Selenium	Se	79.2
Copper	Cu	63.60	Silicon	Si	28.4
"Didymium" . .	Nd + Pr	142±	Silver	Ag	107.93
Erbium	Er	166.	Sodium	Na	23.05
Fluorine	F	19.05	Strontium	Sr	87.68
Gadolinium . . .	Gd	156. ?	Sulphur	S	32.065
Gallium	Ga	70.0	Tantalum	Ta	183.
Germanium . . .	Ge	72.5	Tellurium	Te	127.5 ?
Glucinum	Gl = Be	9.1	Terbium ?	Tb	160.
Gold	Au	197.3	Thallium	Tl	204.15
Helium	He	4.0 ?	Thorium	Th	233.
Hydrogen	H	1.0075	Thulium ?	Tu	170. ?
Indium	In	114.	Tin	Sn	119.0
Iodine	I	126.85	Titanium	Ti	48.17
Iridium	Ir	193.0	Tungsten	W	184.
Iron	Fe	55.9	Uranium	U	240.
Lanthanum . . .	La	138.5	Vanadium	V	51.4
Lead	Pb	206.92	Ytterbium	Yb	173.
Lithium	Li	7.03	Yttrium	Yt	89.0
Magnesium . . .	Mg	24.36	Zinc	Zn	65.40
Manganese . . .	Mn	55.02	Zirconium	Zr	90.5
Mercury	Hg	200.0			

AMERICAN ACADEMY OF ARTS AND SCIENCES.

REPORT OF THE COUNCIL. — PRESENTED MAY 9, 1900.

BIOGRAPHICAL NOTICES.

EPES SARGENT DIXWELL	CHARLES P. BOWDITCH.
JOHN CUMMINGS	WILLIAM H. NILES.
JOHN CODMAN ROPES	JOHN FISKE.
JOHN LOWELL	THORNTON K. LOTHROP.



REPORT OF THE COUNCIL.

THE Academy has lost nineteen members by death since the annual meeting of May 10, 1899, as follows: Six Resident Fellows,— John Harrison Blake, Epes Sargent Dixwell, Charles Franklin Dunbar, Silas Whitecomb Holman, Francis Minot, John Codman Ropes; eight Associate Fellows,— Albert Nicholas Arnold, Frederic Edwin Church, Sir John William Dawson, Manning Ferguson Force, Daniel Raynes Goodwin, William Alexander Hammond, Edward John Phelps, George Clinton Swallow; and five Foreign Honorary Members,— Robert Wilhelm Bunsen, James Martineau, Sir James Paget, Carl Friedrich Rammelsberg, and John Ruskin.

EPES SARGENT DIXWELL.

EPES SARGENT DIXWELL was born in Boston, on the 27th of December, 1807, and died in Cambridge, on the 1st of December, 1899.

He was the son of Dr. John Dixwell, who graduated from Harvard College in 1796 and received the degree of M.D. in 1811, and of Esther Sargent, his wife. Dr. Dixwell was a descendant of the regicide.

Mr. Dixwell was educated at the Boston Latin School, and entered Harvard College when he was not yet sixteen years old. In college he was recognized as an admirable scholar, and the interest which he then showed in literature and music continued through his life, and afforded a solace to his declining years. Graduating from college in the class of 1827, he turned his attention to teaching, though perhaps not then realizing that this was to be the profession of his life. The two years during which he was sub-master of the Boston Latin School were followed by several years spent in the study of law in the office of one of the most eminent lawyers of Boston, Charles G. Loring. He was admitted to the bar in October, 1833, and for three years he practised

his profession; but in the autumn of 1836 he was chosen head-master of the Boston Latin School, and at once took up his work as an instructor of youth, a work which was to occupy his best thoughts and efforts for over a generation. In 1851, owing to certain municipal regulations, he felt called upon to resign his position, and at once opened "The Private Latin School" in Boylston Place, which from its start became very popular. Here he labored for twenty-one years, and when in 1872 he gave up the school with which his name had been so long associated, he found that he had taken part during the course of his teaching in preparing between four and five hundred graduates of Harvard for admission to college, besides teaching many others whose lives bear witness to his instruction.

After relinquishing the active duties of his school, Mr. Dixwell led a quiet and retired life in Cambridge, which he had chosen for his residence in 1842. Here he spent the remainder of his long life, except during two trips to Europe and his summer outings in the mountains or at the seashore. He found in Cambridge the congenial literary atmosphere which he enjoyed, and he contributed his share to the social and scientific life of Cambridge and of Boston. He was a member of various societies, and among others of the American Oriental Society, the Harvard Musical Association, and of our own Society, having been elected to the Academy in August, 1848. But in "The Scientific Club" of Cambridge he took more pleasure, perhaps, than in any other, for here he enjoyed the social intimacy of Agassiz, Peirce, Gray, Quincy, Sparks, Walker, Hill, Everett, Felton, Wyman, and of many others who have held distinguished rank in literary, professional, and scientific circles. With President Felton he had the still closer tie which came from their having been roommates in college.

Though Mr. Dixwell's life was a quiet one by choice, he did not neglect his duties as a citizen and church-goer. He early saw the necessity of manual training in the public schools, and served for many years as a trustee of the Parish fund of his church.

He thoroughly enjoyed his travels in Europe, as it gave him the opportunity which he had long wished for, of wandering through classic scenes and of seeing the wonders of classic and modern art, with which he had already become acquainted through his studies. He is said to have been more familiar with the topography of Rome than were many who had lived there for many years.

He was an admirable classical scholar, and his translations into Latin verse give evidence of his thorough knowledge of the language and of

his ready skill in its use. A little volume of these verses called "*Otia Senectutis*," published in 1885, is a proof that old age had not dulled the critical keenness of his mind. English verse also flowed freely from his pen, and the lines which for many years he was accustomed to write for the annual family gatherings, in which he always took the greatest interest and pleasure, will long be remembered by those who had the privilege of listening to them, for their tender pathos, their wit and their humor.

But it is as a teacher that Mr. Dixwell is best known. As an assistant instructor in the public schools of Boston, as the head-master of the Boston Latin School, and as the master of his own private school for many years, his influence over the education of young men was very wide. His coming to the Latin School was welcomed as a sign that accurate scholarship and a high moral tone would be combined with a strict discipline in the management of that institution, and these expectations were justified in both the great schools with which he was connected. One of his early scholars at the Boston Latin School recalls him as a stimulating and encouraging teacher, always insisting on accuracy, but trying to make his pupils see the beauties of the author whose work they were reading; as a strict disciplinarian, possessed of a dignified bearing, something of a martinet, and inspiring awe in those who were not able to see beneath the somewhat cold exterior the real kindness of his nature.

He was not only a good classical scholar but also was well versed in all the branches which were taught in his school; and the pupil must have been dull indeed who, needing an explanation of a difficult point, left Mr. Dixwell's presence without having the difficulties thoroughly cleared away.

Ready to excuse errors of judgment or of ignorance, he was unwilling to condone moral faults, and his standard in the studies which were taught under his care was high. Bright scholars were encouraged and assisted in their work, and to dull scholars he extended sympathy and a helping hand, but to wilful idleness he was sternly severe. He was anxious to deal justly with all, and if in any individual case he failed to do so, it was not owing to any want of goodwill or kind-heartedness towards the scholar.

With a very high standard of honor in his daily life and in his communion with his fellowmen, he was not always able to make due allowance for the errors of others, and this led him at times to take a somewhat narrow view of his duty; but all who have known him well, will recall

with pleasure the dignified cordiality of his greeting, his kindly sympathy in others' joys and sorrows, his tenderness of heart, and his widespread interest in all that was going on about him. These traits continued to the last, even gaining in intensity as his long life approached its end.

CHARLES P. BOWDITCH.

JOHN CUMMINGS.

HON. JOHN CUMMINGS of Woburn, Mass., was elected Resident Fellow of the Academy, in Class III., Section 3, on the 12th of October, 1881. He was at the time well known in this section of the State as generously promoting the teaching of Natural Science in the public schools, and as liberally aiding institutions and individuals in the prosecution of more advanced scientific work. He was Vice-President of the Boston Society of Natural History, and had materially contributed to its museum by the gift of valuable collections, while the botanical specimens were being arranged and multiplied by his liberality.

One of his noteworthy contributions was the entire financial support he gave to the "Teachers' School of Science" for the first two years of its existence. When he was elected to the Academy this school had become of established value in the diffusion of scientific knowledge and in advancing the true method of teaching from objects and natural features.

At the same time he was identified with those who were establishing and building up the Massachusetts Institute of Technology. He was early made a member of its Corporation and was serving as its Treasurer, an office which he filled with great credit during a long period in the history of the institution when it most needed the services of a treasurer who believed in it and who had the energy and the courage to struggle with many difficulties and discouragements. To him the Institute of Technology is deeply indebted for its present condition.

He was filling many positions of confidence and responsibility and was highly esteemed in business circles. He was President of the Shawmut National Bank; he had served as President of the Boston Board of Trade and of the Shoe and Leather Association; and he had held important offices in the Massachusetts Charitable Mechanic Association, Massachusetts Horticultural Society, and the Perkins Institution for the Blind; he was State Director of the Boston and Albany Railroad, also a director of the Eastern Railroad. He had rendered valuable service as a mem-

ber of the Board of Finance of the Centennial Exposition at Philadelphia, and he had most liberally served his native town of Woburn in performing the duties of many offices and in the support of its public schools.

Such are some of the facts in the life and activities of Mr. Cummings which made him worthy of fellowship in the American Academy of Arts and Sciences.

Besides contributing to the support of institutions and working zealously to make the teachings of science more widely known, he manifested a very unusual interest in the study of nature. He made himself very familiar with the various species of plants growing in the region of his large farm in Woburn, and he profited by every opportunity to become acquainted with the minerals, the rocks, and the physical features of the vicinity. He was a good example of that notable class of men who in the earlier days of science devoted as many hours to the study of nature as their secular duties would permit. In all the various fields of work with which he became associated he was appreciated for the readiness and correctness of his judgment, for the energy with which he labored in the causes he espoused, for his invariable adherence to the highest standard of integrity and of right doing, and for his strong individuality of character.

WM. H. NILES.

JOHN CODMAN ROPES.

JOHN CODMAN ROPES was born in St. Petersburg, Russia, April 28, 1836, and died at his house, 99 Mt. Vernon Street, Boston, early in the morning of October 28, 1899. He was elected a Fellow of the Academy in May, 1885. His father was William Ropes, a native of Salem, and his mother was Mary Anne Codman, daughter of Hon. John Codman. William Ropes was for some time engaged in business in St. Petersburg, but removed to London in 1837 and lived for some time at Islington, where a younger son, the late Dr. F. C. Ropes, was born.

After the return of the family to Boston John Ropes studied for a while at the Chauncy Hall School, but at about the age of fourteen he was obliged to leave school on account of a physical infirmity. Up to that time he had been perfectly well and his figure was erect and shapely. But at about that time a slight curvature of the spine became apparent, which increased rapidly until it became a noticeable malformation. This physical deformity did not embarrass the action of heart or lungs, and during his entire life his health was remarkably good. But nevertheless

the deformity was a very serious burden and prevented Ropes from engaging in activities which would have been most congenial to him. I might add that to those who loved him — and no one knew him who did not — this malformation was simply non-existent. In sitting and talking with him one never thought of him as different from other men.

After leaving the Chauncy Hall School, Ropes was for a while under the care of Dr. Buckminster Brown. He then resumed his studies under Professor Goodwin, who acted as his private tutor and fitted him for college. He was graduated at Harvard in 1857 and soon afterwards entered the Law School, where he received his LL.B. in 1861. While he was proficient in the work of the Law School, it is interesting to observe that in that early time he also took a deep interest in questions of philosophy and religion. He was always a man of profoundly religious nature, with all the strength and earnestness of Puritanism, but without its ascetic features. In the year of his graduating at the Law School he received the Bowdoin prize for an essay on "The Limits of Religious Thought," — a title which strongly suggests that his mind had been exercised by the famous book of Dean Mansel which we were all then reading. For a short time Ropes studied in the office of Peleg W. Chandler and George O. Shattuck. He was admitted to the bar November 28, 1861, and continued to practise law in Boston until the time of his death. In 1865 he formed a partnership with John Chipman Gray of the class of 1859; and thirteen years later W. C. Loring of the class of 1872 was added to the firm, which has since been known as Ropes, Gray and Loring. Ropes' professional work was almost entirely confined to the office. Possibly his physical difficulty may have had something to do with this. He had all the qualities which might have placed him in the very highest ranks as an advocate before the court. He had an almost infallible scent for the essential points in a case, he could disentangle the most complicated details, he could hunt for evidence with a kind of cosmic patience that took everything with the utmost deliberation but never let slip the minutest detail, and he could marshal his arguments with a logical power that was equalled only by the artistic beauty of statement. To hear him argue any point was a genuine delight both to one's reason and to one's æsthetic sense. With all these rare endowments as an advocate, Ropes confined himself principally to business that could be done in the office, especially to the care and management of trust estates. At the time of his death there were more than a hundred trust estates, large and small, in his hands. He had long ago established his reputation as a safe person for taking care of money. He

always showed sound judgment in making investments, and I suspect that one secret of his success was that minute and systematic attention to detail which characterized everything that he did.

The high qualities which might have made him a great advocate found a rich field for their employment in work done outside of office hours; and it is after all by that literary work that he will be longest and most widely known. The recollection of his professional work will of course pass away or be confined to very few persons after the present generation. But his contributions to history have excellences which are likely to secure for them a very long life. His published writings relate almost entirely to military history, in which his two chief topics were the career of Napoleon and the Civil War in America. I think there was in Ropes' nature an infusion of the true soldier. Had he been physically competent for service, he would probably have taken part in the Civil War, like his younger brother Henry, whose brief life was ended at Gettysburg. I fancy that the incapacity for service was a real grief to John Ropes, but it never seemed to disturb his serenity of spirit. If he could not be useful in one way he could in another. If he could not follow in the footsteps of Alexander, he might at least in those of Arrian. The thought of writing a history of the Civil War was one which grew with him into a settled purpose, and very admirable was the sort of preparation which he made for it. It was natural that the subjects uppermost in his mind should come up for discussion in the pleasant evening hours at the club. Gradually there grew up a habit of holding meetings at his house, meetings in which veterans of whatever rank could compare their experiences and discuss mooted questions. Ropes strongly encouraged the preservation of every scrap of experience that could be put upon record, and thus grew up the habit of preparing historical papers to be read and discussed at these informal meetings. In this way Ropes became the founder of a most valuable institution, — the Military Historical Society of Massachusetts. For several years this body held its meetings at Ropes' house, where the speaker of the evening was apt to dine before the meeting and where the sessions were sure to end with a social glass and abounding good-fellowship. The publications of this Society, though few in number, are of great value. In recent years it has found a permanent habitation in one of the rooms of the Cadet Armory where Ropes, some time ago, placed the larger part of his valuable historical library.

One of the first literary results of these studies was an elaborate examination of the Virginia Campaign of General Pope in 1862, a summary

of which was furnished by Ropes in his volume entitled "The Army under Pope," being one of the volumes of Scribner's series on the Civil War. Among other things it may be said of this book that it completely exonerates General Fitz John Porter from the charges brought against him after the second battle of Bull Run and upon which he was so unjustly and cruelly condemned. I have been told that Ropes' weighty presentation of the case exerted no small influence upon the final verdict which declared General Porter innocent and went as far as possible toward repairing the grievous wrong that had been done. If no other result had come from founding the Military Historical Society, this alone would have more than justified its existence.

But Ropes' *magnum opus*, "The Story of the Civil War," was unfortunately never completed. It would have filled four volumes, and death removed the author soon after the publication of the second. The loss is one that can never be made good. Other writers of course may go over the period which Ropes failed to cover, but nobody can complete his book, for it is a case in which the writer's individual characteristics and personal experience are the all-important features. We have heard much in recent years of the advantages of the co-operative method in writing history, whereby a hundred experts may take each a small fragment of the ground to be covered. The merits of such a method are not denied, but it has one great defect: it gives us Hamlet with the Prince of Denmark left out. In an historical narrative nothing can make up for the personality of the narrator. A hundred experts on the Civil War would not fill Ropes' place for the simple reason that their hundred individual experiences cannot be combined in the same stream of consciousness. Ropes had gathered experience from every quarter; he had not only read pretty much everything worth reading on his subject, he had not only delved with endless patience in the original documents, but he had obtained through social intercourse with soldiers now passed away a truly enormous fund of information, a great part of which has surely perished with him. I remember that during the last two or three years the thought sometimes occurred to him that he might not live to finish his book. He told me one day that he only lacked eight years of being three score and ten, and that eight years were all too short a period for finishing the two volumes that remained to be done; he must therefore "scorn delight and live laborious days." He was always extremely fond of society; no man more keenly enjoyed a dinner-party or an evening at the club, and I can testify that sometimes after club hours were over we used to enjoy prolonging our friendly chat quite into the morning hours;

but in these latter days Ropes became much more chary of his time and subjected himself to a kind of discipline in order that his work might be finished.

In another direction and in dealing with a more limited theme, he achieved a finished piece of work. He had always entertained a warm admiration for the First Napoleon. It was natural that such an acute military critic should admire such transcendent military genius. But Ropes carried his admiration to an extent with which not all his friends found it easy to sympathize. In his little book entitled "The First Napoleon" Ropes appears as the great Corsican's advocate, and his case is presented with consummate skill. It has all the more weight because the author is far too skilful to weaken his case by over statement or by any too conspicuous warmth of enthusiasm. It is a masterly piece of writing, although in its philosophic grasp of the man and the period it is surely far inferior to the book published about the same time by the late Sir John Seeley.

It was in relation to the Waterloo Campaign that Ropes produced the completely finished work already alluded to. No battle of the nineteenth century has called for so much discussion as Waterloo; and most of the discussion has centred about the question, "Why did Napoleon lose the battle?" The books on this subject are legion, and they present us with an English view of the situation and a Prussian view, and ever so many French views, according to the political and personal predilections of the writers. Usually we find some particular antecedent selected as explaining the mighty result, while other antecedents receive inadequate attention or are passed over. One writer is impressed with the inefficiency of Grouchy, another one traces the catastrophe to the aimless wanderings of Erlon's corps on the sixteenth of June, and so on. But in Ropes' monograph what chiefly impresses us is the fact that he weighs every circumstance with the greatest care and puts real mental effort into the work of estimating the precise share which each circumstance took in the general mass of causation. In the first place the quality of the French army is duly considered and compared with the quality of the allied forces. Then such facts as the Emperor having Soult for Chief of Staff, an unaccustomed position for that able marshal, his feeling it necessary to leave at Paris the invincible Davoust, and other like circumstances, receive due attention. The mysterious movements of Erlon, which prevented his being of any use either to Ney at Quatre Bras or to Napoleon at Ligny, are more acutely analyzed than in any other book. Then the consequences of the very incomplete defeat of Blücher on the

sixteenth are carefully considered. Then Napoleon's great and unusual blunder in assuming an eastward retreat for the Prussians and acting upon the assumption without verifying it, is properly characterized. The share wrought by the muddy roads and the rains is not forgotten, nor the physical weaknesses which hampered the great general and allowed him now and then to be caught napping for a moment; the masterly position taken by Wellington; the effects of the topography; the extent to which the Emperor's attention was diverted early in the afternoon in the direction of Planchenoit, — not one of these points is forgotten or slurred over. It is this minute quantitative consideration of details that impresses upon Ropes' historical writings their truly scientific character, and no theme could have been better calculated to exhibit it in its perfection than the campaign of Waterloo. One cannot read the book carefully without feeling that for once in the world something has been done so exhaustively that it will not need to be done again. It would seem almost impossible for the most fertile mind to offer a suggestion of anything actual, probable, or possible about Waterloo that our author has not already brought forward and considered. Those who write such books are few, and to study them is a great and profitable stimulus. As this monograph on Waterloo related to a subject already well understood in Europe, it immediately gave Ropes a high reputation in European circles, and I believe he is regarded by experts as one of the soundest military critics since the days of Jomini.

JOHN FISKE.

JOHN LOWELL

JOHN LOWELL, the fourth of that name in direct descent from the first minister of Newburyport, who died in 1767, was born in Boston on the 18th of October, 1824. He was elected, in October, 1877, a Fellow of this Academy, of which his great-grandfather had been one of the original incorporators in 1780, and both his father and grandfather Fellows.

At the time of his birth his father was living on the lower (southerly) corner of what are now Bedford and Chauncy streets; but at that time, between Bedford and Summer streets, at the points where Chauncy Street now turns off, there was on Summer Street a place called Chauncy Place, running about two-thirds of the way through, and then closed by a brick wall with two openings for foot passengers, but none for vehicles, and turning up from Bedford Street a similar place called Bedford Place, on the upper side of which and next to the wall stood the house of Judge Charles Jackson, having a large garden and pear

orchard extending down the place until it touched the garden of Judge Prescott, which stretched from there up Bedford Street towards Washington. The lower side of Bedford Place was occupied by a row of brick houses, and in the one at the corner, as has already been said, John Lowell was born.

In Chauncy Place, next to the dividing wall between that and Bedford Place, stood the Chauncy Hall School, then under the management of a well-known teacher, Gideon F. Thayer. To this school, partly perhaps from its nearness as well as for its reputation, Judge Lowell was sent, as soon as he was old enough to go to any man's school. He was fitted for college in the private school of Daniel G. Ingraham, who kept for more than twenty years the leading private classical school in Boston, and graduated at Harvard in 1843 at the age of eighteen years, with high distinction in Greek, Latin, Philosophy, and History, — indeed it would seem that he must have been recognized as especially proficient in Greek, as at the Sophomore Exhibition in October, 1841, he was one of the speakers in A Greek Dialogue, "Extract from Shakspeare's Henry the Fourth: Glendower and Hotspur;" and at the corresponding Exhibition in his Junior year, had a Greek oration, "*Βύρων ἐν Ἑλλάδι.*" He was among the first scholars in his class: of his Commencement part, an English oration, the Rev. Dr. John Pierce wrote in his diary: "The subject of this oration was 'The Battle of the Nile,' — eight minutes in length, a summary of the principal facts."*

After leaving college Lowell entered the Dane Law School, and remained there for the full course of two years. He was then for a year in the office of Mr. Charles G. Loring, and was admitted to the bar in 1846. Directly afterwards he went to Europe with his father and family, and was absent about a year. On his return he formed a connection with his brother-in-law, Mr. William Sohier, and began the practice of the law. This connection lasted until 1857, when he took an office by himself.

The business in Mr. Sohier's office was mostly chamber practice, and largely connected with the management of trust estates, and Mr. Lowell's work there was not such as to give him the opportunity for any especial display of ability, or to attract any one's attention. His name, I think, appears only twice in the Massachusetts Reports for this period. In the autumn of 1857 he separated from Mr. Sohier almost at the moment when the financial difficulties of that time were reaching their

* Mass. Hist. Soc. Proceedings, Series II., V. p. 237.

crisis. These difficulties affected very seriously the manufacturing interests of this part of the Commonwealth, and many of the large mercantile firms who had been the agents of the factories. The family and business connections of Mr. Lowell and his father naturally caused him to be consulted in some of these matters, and he thus became interested in the consideration of questions arising in bankruptcy and insolvency, a branch of the law in which as a judge he subsequently acquired a well-deserved and widespread reputation.

He continued in the practice of the law until 1865. During part of this time he had charge of the "Law Reporter," a monthly journal then published in Boston. From May, 1856, he was for two years its sole editor, and afterwards until April, 1860, joint editor with Mr. Samuel M. Quincy of the Boston bar. Four volumes (Vols. 19, 20, 21, and 22) were published while he was editor.

Upon the resignation of Judge Sprague of the United States District Court of Massachusetts, in March, 1865, Mr. Lowell was appointed his successor. The appointment was wholly unsolicited by Mr. Lowell. It was made upon the recommendation of a few of the leaders of the Suffolk bar. The letter which they addressed to the President was written by Mr. Charles G. Loring, and was signed by himself, Mr. Charles B. Goodrich, Mr. Sidney Bartlett, Judge Josiah G. Abbott, Mr. Samuel E. Sewall, Mr. Edward D. Sohier, Mr. George Bemis, and Mr. Dwight Foster. It was carried to Washington at the same time with Judge Sprague's resignation by Mr. Richard H. Dana, Jr., who was then the United States attorney here. The nomination was suggested to Mr. Lincoln by Mr. Sumner and Mr. Dana, and was made and confirmed on the same day.

The appointment was one peculiarly gratifying to Mr. Lowell, for his great-grandfather, Judge John Lowell, had been appointed in 1789 by General Washington to this same office, and was the first District Judge of the United States for the District of Massachusetts, and Mr. Lowell felt a natural and proper pride and pleasure in succeeding to the honorable position and duties of his ancestor. In 1878, on the death of the Honorable George F. Shepley, Judge of the Circuit Court of the United States for the First Circuit, he was made Circuit Judge, thus again succeeding his great-grandfather, who had been appointed by President John Adams to a similar position in the court which the Federalists created in the last year of President Adams's administration, only to have the act creating it repealed and the court destroyed by the Democrats under Jefferson, as the simplest mode of getting rid of the Federalist judges whom Adams had appointed.

In May, 1884, a little more than nineteen years after his first appointment to the bench, Judge Lowell resigned his position as Circuit Judge, and resumed the practice of the law in Boston. His long period of judicial service had given the public ample opportunity to recognize his legal ability and wisdom, and from the time he returned to the bar until his last short illness, he was fully occupied with professional work. He served as arbitrator, or sat as a commissioner or special master in many causes and matters of importance; he was retained as counsel in litigations involving large interests and difficult questions, and his advice was constantly sought in solving the perplexities that arise in the administration of the law of bankruptcy. Fortunately for him this professional work was interesting and stimulating and sufficiently engrossing to distract his mind from domestic griefs and anxieties, which weighed upon him heavily at intervals.

During these years he two or three times visited Europe in the summer with his family, before a severe accident to his wife rendered it difficult for her to travel.

He married, in 1853, Lucy Buckminster, the only daughter of Mr. George B. Emerson and of Olivia Buckminster, his wife, daughter of the Rev. Joseph Buckminster of Portsmouth, N. H., and sister of the Rev. Joseph Stevens Buckminster of Brattle Square Church, Boston. For some time after his marriage Judge Lowell lived at No. 11 Chestnut Street, in the house in which his wife was born, but in 1858 he purchased a farm lying between Chestnut Hill and Hammond's Pond, where he lived until his death on the 14th of May, 1897. He had inherited a taste for country life and an interest in trees and plants, shrubs and flowers, from which he derived during these years great enjoyment; and the time which he passed in going about his place, in looking at the improvements he had made, and considering those which he proposed to make, undoubtedly contributed to the preservation of his health and the prolongation of his life. He was not a man of remarkable physique, yet until his last illness it is doubtful whether he was ever detained from his office for two days at a time by any physical ailment.

In addition to the labors of his profession, he filled during these latter years many positions of importance and responsibility. In 1896 he was appointed by Governor Wolcott chairman of the commission to revise the laws of Massachusetts on the subject of taxation, and held this office at the time of his death. He was also Vice-President of the Massachusetts General Hospital, of which he had been for many years one of the Trustees; was President of the Trustees of the Peabody Fund, an Overseer

of Harvard University, and a Member of the Massachusetts Historical Society. He received the degree of Doctor of Laws from Williams College in 1870, and from Harvard in 1871.

Before his appointment as District Judge, Mr. Lowell's work at the bar had been chiefly office practice. His clients, if not very numerous, were warmly attached to him, were continually demanding his counsel, and had the most implicit confidence in the opinions he gave them. When consulted by any one of them he rarely looked at a book; but after hearing what the client had to say, would sit perfectly quiet, until he had sufficiently considered the question, and then advise him in a way showing intuitive sagacity and familiarity both with the fundamental principles of the law and their application by the courts. He was always a diligent student, reading carefully, digesting slowly, and assimilating thoroughly what was new or seemed to him important in the volumes of reports that from time to time appeared, so that when his judicial work began he was well equipped for the duties that devolved upon him.

The District Court of the United States, of which he was at first appointed Judge, is a court of limited and peculiar jurisdiction; it has the exclusive cognizance of admiralty and maritime cases, and of all crimes committed upon the high seas; it is also a prize court, and sits as a criminal court, for the trial of offences against the laws of the United States, such as violations of the post-office laws, revenue laws, etc. The number of jury trials in this court is, however, very limited and mostly confined to criminal cases, usually of great simplicity. Judge Lowell's want of experience in practice before a jury, and in dealing with juries, was for this reason a source of much less embarrassment to him in this court than it would have been in most others. He had, in fact, before his appointment tried only one jury case, and was perfectly aware of the difficulties under which he labored in public speaking. Time and constant practice diminished these difficulties, and made it more easy for him to preside at jury trials, as he gradually overcame the obstacles which sprang largely from his want of training and experience, and a lack of confidence in himself. The civil war was not over when he was appointed to the bench, and the effect of the destruction of our merchant marine by the guns of the Confederate cruisers, and of the transfer of our ships to foreign owners, now so evident in many other ways besides that of the sadly diminished number and importance of the suits in Admiralty, had not then made themselves thoroughly felt. At the time of his appointment there were many causes pending which Judge Sprague's long illness had prevented his hearing, and Judge Lowell had at first no lack of

Admiralty suits of all kinds, including some difficult questions in prize causes. The principles and practice of the Admiralty Courts were especially congenial to him. He was in full sympathy with the tenderness which that court has always shown for the ignorant and improvident sailor; and the cardinal rule of the Admiralty that no error of statement, or technical defect, or mistake in the kind of relief asked for, should interfere with or prevent such a decision of a cause as would work substantial justice between the parties, was in entire harmony with his view as to what should be the aim of all courts and judges so far as the established rules of law and the decided cases would permit, — an opinion which he held so strongly, that for his efforts to attain this end, he was at times called "wayward" in his decisions.

At the time of Judge Lowell's appointment, there was no national bankrupt act in force, although there was an insolvent act in Massachusetts with which and its operation he was very familiar; two years after he became the judge of the District Court, Congress passed the National Bankrupt Act of 1867, in the administration of which he won a distinction which placed him among the foremost, — it is perhaps not too much to say, at the head of the judges in this country, having original jurisdiction of cases in Bankruptcy and charged with the administration of this law.

As has already been said, the subject of Bankruptcy had interested him many years before his appointment to the bench; he had begun the preparation of the treatise on this branch of the law which since his death has been published by his son, and the work he had done on this book had made him unusually familiar with the underlying principles of the Bankrupt Laws and the adjudicated cases. The purposes of a bankrupt act, — to secure the equitable distribution of an insolvent debtor's assets among his creditors, to grant him his discharge from his antecedent liabilities if he has honestly surrendered his property to be distributed for the payment of his debts, — and, on the other hand, to prevent such a debtor, who has fraudulently concealed for his own advantage a part of his estate, or unfairly preferred some of his creditors, from receiving the benefit of the act, — these purposes equitable in both aspects, and the simplicity and directness of the methods of procedure under the practice in Bankruptcy, were all in harmony with his convictions of the useful and beneficent purposes of the law and the courts of justice, and made the administration of this law a congenial task, which he discharged not merely to the satisfaction of the bar, but to the approval of the mercantile class of the community whose interests are most affected by this law, who

are perfectly able to understand it and to judge whether it is wisely administered, and in the spirit of justice and fair dealing upon which it is founded. Upon Judge Lowell's retirement from the bench in May, 1884, the merchants of Boston invited him to a public dinner, that they might have an opportunity of testifying their high esteem and affectionate consideration for him as an administrator of the laws which most nearly concerned them in their business relations, whose decisions and interpretations of these laws had received the approval of the mercantile community throughout the land. This unusual tribute, coming from the source from which it emanated, was most gratifying to Judge Lowell as a proof that his administration of the Bankrupt Law had not only been in accord with the strong common sense of the business men of the community, but also with the principles of justice and equity which it has been the aim of every well-intended law of Bankruptcy to carry out. The mercantile community still further showed its appreciation of him by requesting him at a later date to prepare a new Bankrupt Act to be laid before Congress. But this act was unfortunately not passed.

The jurisdiction of the Circuit Court of the United States for the First Circuit, of which Judge Lowell was appointed Judge in 1878, includes the States of Maine, New Hampshire, and Rhode Island, as well as Massachusetts, and his duties as Circuit Judge brought him in contact with the members of the bar and the people of all these States; that he discharged these duties to their satisfaction was shown by the attendance of lawyers from every State in the circuit, at the bar meeting in Boston after his death, and by the abundant testimony they gave of their recognition and thorough appreciation of his worth and ability, both as a magistrate and a man. The business of the Circuit Court and the class of cases tried there is quite different from that of a District Court. It has no original jurisdiction in Bankruptcy or Admiralty, but in these matters sits only as a Court of Appeals. It deals more largely with cases at common law and with civil suits for violation of the revenue law. It has also jurisdiction of patent causes, a branch of the law which is thought to require some special aptitude for and knowledge of mechanics as well as of the physical sciences. Neither Judge Lowell's professional work at the bar nor on the bench had ever brought him to the study of this branch of the law, and he was at the outset and continued to be unduly distrustful of his ability to master and properly decide the patent cases that were brought before him. As he occasionally jocosely expressed it, "he was afraid of only one thing in the law, — those infernal machines." But he applied himself with the conscientiousness and thoroughness that

distinguished all his work to the study and investigation of these cases, and by the common consent of the counsel practising in patent cases, proved himself an excellent patent judge.

His judicial opinions are marked by clearness of thought, and the direct, terse, and vigorous expression of it, with no digressions, no discussions or dicta not absolutely necessary to the determination of the precise points before him. In deciding a cause he took the line of least resistance; if it were a short cut he availed himself of it, and this not so much because this course saved him labor, as because he intended his judgment to be confined to the determination of the case actually before him. He was careful, therefore, not to stray from the real questions at issue, and to avoid being beguiled into by-paths of interesting legal investigation which had but little or no tendency to enlighten or aid him in arriving at his conclusions, and were not important in determining his final results.

He had a natural aptitude for the law, one might almost say a legal instinct, and this was strengthened and quickened by thought and study; he possessed as a judge a remarkable intuition "for perceiving on which side lay the justice of any case and an equally remarkable ingenuity in showing that a decision in favor of that side was in accordance with the settled rules of law." When he found himself obliged to yield to precedents which prevented what justice seemed to him to require, he did so with a reluctance which he never tried to conceal and sometimes openly expressed. His quiet humor not infrequently enlivened the trial of a cause, and occasionally appeared in his Opinions, as when in denying a motion to set aside a verdict because one juror had been asleep during part of the trial, he said: "If one of the jurors was asleep, the defendant should have called attention to the fact at the time. There is no suggestion that it is newly discovered, and I cannot now say that the defendant may not have thought his interests were promoted by the actual course of the trial in this respect." Or, to quote one more instance, — in a suit where a ship owner contended that the master had forfeited his wages by taking on board some casks of Madeira wine, the ship articles prohibiting him from carrying *distilled spirits* under penalty of forfeiting his pay, Judge Lowell demolished the elaborate argument of the counsel for the ship owner by saying, "Wine is not distilled spirits, and cannot be made so by a usage of the port of New Bedford or any other process that I am acquainted with, except distillation."

Any attempt to characterize Judge Lowell's judicial qualities would be imperfect if it failed to recognize and call attention to the fact that

he had not merely the respect, but the warm affection of the members of the bar. His simple and unassuming manner claimed nothing, yet no one ever thought of treating him with discourtesy. His natural kindness led him to treat the youngest members of the bar and to listen to their arguments, however crudely presented, with a never-failing patience and consideration; and both on and off the bench, he was always, in his relations with them, cordial, friendly, and ready to give them the benefit of his wisdom and learning in any difficulty in which they might ask his advice, doing this in such a manner that he rather seemed to be receiving than conferring a favor. He was not merely a learned lawyer; he was also a lover of books, a great reader, catholic in his tastes, and spending in his library many of his hours of rest and recreation. In private life he was an agreeable companion, a loyal friend, a most devoted husband and father. He was not a demonstrative person, but "a quiet, self-contained, thoughtful, courageous, affectionate man, who kept his eye single for the right and the true, who did every duty with keen thoroughness, and who found his greatest pleasure in the companionship of those nearest and dearest to him."

THORNTON K. LOTHROP.

Other notices are postponed.

The number of new members elected during the year is as follows: Resident Fellows, 4; Associate Fellows, 5; Foreign Honorary Members, 4.

The roll of the Academy at present includes 194 Resident Fellows, 89 Associate Fellows, and 66 Foreign Honorary Members.*

* By transfer of an Associate Fellow to Resident Fellowship, and by election of new members at the annual meeting, the roll stands at date of publication 198 Resident Fellows, 93 Associate Fellows, and 69 Foreign Honorary Members.

American Academy of Arts and Sciences.

OFFICERS AND COMMITTEES FOR 1899-1900.

PRESIDENT.

ALEXANDER AGASSIZ.

VICE-PRESIDENTS.

Class I.

JOHN TROWBRIDGE.

Class II.

ALPHEUS HYATT.

Class III.

AUGUSTUS LOWELL.

CORRESPONDING SECRETARY.

SAMUEL H. SCUDDER,
May, 1899—January, 1900.

WILLIAM M. DAVIS,
January—May, 1900.

RECORDING SECRETARY.

WILLIAM WATSON.

TREASURER.

FRANCIS BLAKE.

LIBRARIAN.

A. LAWRENCE ROTCH.

COUNCILLORS.

Class I.

HENRY TABER,
THEODORE W. RICHARDS,
HARRY M. GOODWIN.

Class II.

BENJAMIN L. ROBINSON,
WILLIAM T. COUNCILMAN,
JOHN E. WOLFF.

Class III.

BARRETT WENDELL,
EDWARD ROBINSON,
JAMES B. AMES.

COMMITTEE OF FINANCE.

ALEXANDER AGASSIZ,

FRANCIS BLAKE,

AUGUSTUS LOWELL.

RUMFORD COMMITTEE.

ERASMUS D. LEAVITT,
AMOS E. DOLBEAR,

EDWARD C. PICKERING, CHARLES R. CROSS,
ARTHUR G. WEBSTER, THEODORE W. RICHARDS,
THOMAS C. MENDENHALL.

C. M. WARREN COMMITTEE.

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CHARLES L. JACKSON,
LEONARD P. KINNICUTT,
ROBERT H. RICHARDS.

SAMUEL CABOT,
ARTHUR M. COMEY,

COMMITTEE OF PUBLICATION.

SAMUEL H. SCUDDER,

SETH C. CHANDLER,

CRAWFORD H. TOY.

COMMITTEE ON THE LIBRARY.

A. LAWRENCE ROTCH,

HENRY W. HAYNES,

SAMUEL HENSHAW.

AUDITING COMMITTEE.

HENRY G. DENNY,

WILLIAM L. RICHARDSON.

LIST

OF THE

FELLOWS AND FOREIGN HONORARY MEMBERS.

(Corrected to May 20, 1900.)

RESIDENT FELLOWS.—198.

(Number limited to two hundred.)

CLASS I.—*Mathematical and Physical Sciences.*—79.

SECTION I.—20.

Mathematics and Astronomy.

Solon I. Bailey,	Cambridge.
Maxime Bôcher,	Cambridge.
William E. Byerly,	Cambridge.
Seth C. Chandler,	Cambridge.
J. Rayner Edmands,	Cambridge.
Gustavus Hay,	Boston.
Henry Mitchell,	Nantucket.
William F. Osgood,	Cambridge.
James Mills Peirce,	Cambridge.
Edward C. Pickering,	Cambridge.
William H. Pickering,	Cambridge.
John Ritchie, Jr.,	Boston.
John D. Runkle,	Cambridge.
T. H. Safford,	Williamstown.
Edwin F. Sawyer,	Brighton.
Arthur Searle,	Cambridge.
William E. Story,	Worcester.
Henry Taber,	Worcester.
O. C. Wendell,	Cambridge.
P. S. Yendell,	Dorchester.

SECTION II.—21.

Physics.

A. Graham Bell,	Washington, D.C.
Clarence J. Blake,	Boston.
Francis Blake,	Weston.

Charles R. Cross,	Brookline.
Amos E. Dolbear,	Somerville.
H. M. Goodwin,	Boston.
Edwin H. Hall,	Cambridge.
Hammond V. Hayes,	Cambridge.
William L. Hooper,	Somerville.
William W. Jacques,	Newton.
Frank A. Laws,	Boston.
Henry Mefavour,	Williamstown.
T. C. Mendenhall,	Worcester.
Benjamin O. Peirce,	Cambridge.
A. Lawrence Rotch,	Boston.
Wallace C. Sabine,	Cambridge.
John S. Stone,	Boston.
Elihu Thomson,	Swampscott.
John Trowbridge,	Cambridge.
A. G. Webster,	Worcester.
Robert W. Willson,	Cambridge.

SECTION III.—24.

Chemistry.

Samuel Cabot,	Boston.
Arthur M. Comey,	Cambridge.
James M. Crafts,	Boston.
Thos. M. Drown, So.	Bethlehem, Pa.
Charles W. Eliot,	Cambridge.
Thomas Gaffield,	Boston.
Henry B. Hill,	Cambridge.

Charles L. Jackson, Cambridge.
 Walter L. Jennings, Worcester.
 Leonard P. Kinnicutt, Worcester.
 Charles F. Mabery, Cleveland, O.
 Arthur Michael, Boston.
 George D. Moore, Worcester.
 Charles E. Munroe, Wash'gton, D.C.
 John U. Nef, Chicago, Ill.
 Arthur A. Noyes, Boston.
 Robert H. Richards, Boston.
 Theodore W. Richards, Cambridge.
 Charles R. Sanger, Cambridge.
 Stephen P. Sharples, Cambridge.
 Francis H. Storer, Boston.
 Henry P. Talbot, Newton.
 Charles H. Wing, Ledger, N. C.
 Edward S. Wood, Boston.

SECTION IV. — 14.

Technology and Engineering.

Eliot C. Clarke, Boston.
 Ira N. Hollis, Cambridge.
 Gaetano Lanza, Boston.
 E. D. Leavitt, Cambridgeport.
 William R. Livermore, Boston.
 Hiram F. Mills, Lowell.
 Cecil H. Peabody, Boston.
 Alfred P. Rockwell, Manchester.
 Andrew H. Russell, Wash'ton, D.C.
 Peter Schwamb, Arlington.
 Charles S. Storrow, Boston.
 George F. Swain, Boston.
 William Watson, Boston.
 Morrill Wyman, Cambridge.

CLASS II. — *Natural and Physiological Sciences.* — 64.

SECTION I. — 13.

Geology, Mineralogy, and Physics of the Globe.

H. H. Clayton, Milton.
 Algernon Coolidge, Boston.
 William O. Crosby, Boston.
 William M. Davis, Cambridge.
 Benj. K. Emerson, Amherst.
 O. W. Huntington, Newport, R. I.
 Robert T. Jackson, Boston.
 William H. Niles, Cambridge.
 John E. Pillsbury, Boston.
 Nathaniel S. Shaler, Cambridge.
 Robert DeC. Ward, Cambridge.
 John E. Wolff, Cambridge.
 J. B. Woodworth, Cambridge.

SECTION II. — 11.

Botany.

Geo. E. Davenport, Medford.
 William G. Farlow, Cambridge.
 Charles E. Faxon, Boston.
 Merritt L. Fernald, Cambridge.
 George L. Goodale, Cambridge.

H. H. Hunnewell, Wellesley.
 John G. Jack, Boston.
 B. L. Robinson, Cambridge.
 Charles S. Sargent, Brookline.
 Arthur B. Seymour, Cambridge.
 Roland Thaxter, Cambridge.

SECTION III. — 25.

Zoölogy and Physiology.

Alexander Agassiz, Cambridge.
 Robert Amory, Boston.
 James M. Barnard, Milton.
 Henry P. Bowditch, Boston.
 William Brewster, Cambridge.
 Louis Cabot, Brookline.
 William E. Castle, Cambridge.
 Samuel F. Clarke, Williamstown.
 W. T. Councilman, Boston.
 Charles B. Davenport, Chicago, Ill.
 Harold C. Ernst, Boston.
 J. Walter Fewkes, Washington, D.C.
 Edward G. Gardiner, Boston.
 Samuel Henshaw, Cambridge.
 Alpheus Hyatt, Cambridge.

John S. Kingsley, Somerville.
 Edward L. Mark, Cambridge.
 Charles S. Minot, Boston.
 Edward S. Morse, Salem.
 George H. Parker, Cambridge.
 James J. Putnam, Boston.
 Samuel H. Scudder, Cambridge.
 William T. Sedgwick, Boston.
 James C. White, Boston.
 William M. Woodworth, Cambridge.

SECTION IV. — 15.

Medicine and Surgery.

Samuel L. Abbot, Boston.

Edward H. Bradford, Boston.
 Arthur T. Cabot, Boston.
 David W. Cheever, Boston.
 Frank W. Draper, Boston.
 Thomas Dwight, Boston.
 Reginald H. Fitz, Boston.
 Charles F. Folsom, Boston.
 Frederick I. Knight, Boston.
 Samuel J. Mixter, Boston.
 W. L. Richardson, Boston.
 Theobald Smith, Boston.
 O. F. Wadsworth, Boston.
 Henry P. Walcott, Cambridge.
 John C. Warren, Boston.

CLASS III. — *Moral and Political Sciences.* — 55.

SECTION I. — 11.

Philosophy and Jurisprudence.

James B. Ames, Cambridge.
 Charles C. Everett, Cambridge.
 Horace Gray, Boston.
 John C. Gray, Boston.
 G. Stanley Hall, Worcester.
 Nathaniel Holmes, Cambridge.
 John E. Hudson, Boston.
 Francis C. Lowell, Boston.
 Josiah Royce, Cambridge.
 Jeremiah Smith, Cambridge.
 James B. Thayer, Cambridge.

Charles R. Lanman, Cambridge.
 David G. Lyon, Cambridge.
 Bennett H. Nash, Boston.
 Frederick W. Putnam, Cambridge.
 Edward Robinson, Boston.
 F. B. Stephenson, Boston.
 Joseph H. Thayer, Cambridge.
 Crawford H. Toy, Cambridge.
 John W. White, Cambridge.
 John H. Wright, Cambridge.
 Edward J. Young, Waltham.

SECTION II. — 20.

Philology and Archæology.

William S. Appleton, Boston.
 Charles P. Bowditch, Boston.
 Lucien Carr, Cambridge.
 Franklin Carter, Williamstown.
 Joseph T. Clarke, Boston.
 Henry G. Denny, Boston.
 William Everett, Quincy.
 William W. Goodwin, Cambridge.
 Henry W. Haynes, Boston.

SECTION III. — 11.

Political Economy and History.

Charles F. Adams, Lincoln.
 Edward Atkinson, Boston.
 Andrew M. Davis, Cambridge.
 John Fiske, Cambridge.
 A. C. Goodell, Salem.
 Henry C. Lodge, Nahant.
 A. Lawrence Lowell, Boston.
 Augustus Lowell, Boston.
 James F. Rhodes, Boston.
 Denman W. Ross, Cambridge.
 Charles C. Smith, Boston.

SECTION IV.—13.

Literature and the Fine Arts.

Francis Bartlett,	Boston.	T. W. Higginson,	Cambridge.
John Bartlett,	Cambridge.	George L. Kittredge,	Cambridge.
Arlo Bates,	Boston.	S. R. Koehler,	Boston.
George S. Boutwell,	Groton.	Charles G. Loring,	Boston.
J. Elliot Cabot,	Brookline.	Percival Lowell,	Boston.
		Charles Eliot Norton,	Cambridge.
		Horace E. Scudder,	Cambridge.
		Barrett Wendell,	Boston.

ASSOCIATE FELLOWS. — 93.

(Number limited to one hundred. Elected as vacancies occur.)

CLASS I. — *Mathematical and Physical Sciences.* — 34.

SECTION I. — 14.

Mathematics and Astronomy.

Edward E. Barnard, Williams Bay,
S. W. Burnham, Chicago. [Wis.
George Davidson, San Francisco.
Fabian Franklin, Baltimore.
Asaph Hall, Cambridge, Mass.
George W. Hill, W. Nyack, N.Y.
E. S. Holden, Washington.
James E. Keeler, Mt. Hamilton, Cal.
Emory McClintock, Morristown, N.J.
Simon Newcomb, Washington.
Charles L. Poor, Baltimore.
George M. Searle, Washington.
J. N. Stockwell, Cleveland, O.
Chas. A. Young, Princeton, N. J.

SECTION II. — 6.

Physics.

Carl Barus, Providence, R.I.
J. Willard Gibbs, New Haven.
S. P. Langley, Washington.

A. A. Michelson, Chicago.
Ogden N. Rood, New York.
H. A. Rowland, Baltimore.

SECTION III. — 7.

Chemistry.

Wolcott Gibbs, Newport, R.I.
Frank A. Gooch, New Haven.
S. W. Johnson, New Haven.
J. W. Mallet, Charlottesville, Va.
E. W. Morley, Cleveland, O.
J. M. Ordway, New Orleans.
Ira Remsen, Baltimore.

SECTION IV. — 7.

Technology and Engineering.

Henry L. Abbot, New York.
Cyrus B. Comstock, New York.
W. P. Craighill, Charlestown, W.
F. R. Hutton, New York. [Va.
George S. Morison, Chicago.
William Sellers, Edgemoor, Del.
Robt. S. Woodward, New York.

CLASS II. — *Natural and Physiological Sciences.* — 30.

SECTION I. — 14:

Geology, Mineralogy, and Physics of the Globe.

Cleveland Abbe, Washington.
George J. Brush, New Haven.
Edward S. Dana, New Haven.
Walter G. Davis, Cordova, Arg.
George M. Dawson, Ottawa.

G. K. Gilbert, Washington.
Clarence King, New York.
Joseph LeConte, Berkeley, Cal.
J. Peter Lesley, Milton, Mass.
S. L. Penfield, New Haven.
J. W. Powell, Washington.
R. Pumpelly, Newport, R.I.
A. R. C. Selwyn, Ottawa.
Charles D. Walcott, Washington.

SECTION II.—5.

Botany.

L. H. Bailey,	Ithaca.
D. H. Campbell,	Palo Alto, Cal.
J. M. Coulter,	Chicago.
John D. Smith,	Baltimore.
W. Trelease,	St. Louis.

SECTION III.—5.

Zoölogy and Physiology.

Joel A. Allen,	New York.
W. K. Brooks,	Lake Roland, Md.

S. Weir Mitchell,	Philadelphia.
A. S. Packard,	Providence, R.I.
A. E. Verrill,	New Haven.

SECTION IV.—6.

Medicine and Surgery.

John S. Billings,	New York.
Jacob M. Da Costa,	Philadelphia.
William Osler,	Baltimore.
Alfred Stillé,	Philadelphia.
Wm. H. Welch,	Baltimore.
H. C. Wood,	Philadelphia.

CLASS III.—*Moral and Political Sciences.*—29.

SECTION I.—7.

Philosophy and Jurisprudence.

James C. Carter,	New York.
Joseph H. Choate,	New York.
Melville W. Fuller,	Washington.
William W. Howe,	New Orleans.
William Mitchell,	St. Paul.
Charles S. Peirce,	Milford, Pa.
T. R. Pynchon,	Hartford, Conn.

SECTION II.—8.

Philology and Archæology.

Timothy Dwight,	New Haven.
B. L. Gildersleeve,	Baltimore.
D. C. Gilman,	Baltimore.
T. R. Lounsbury,	New Haven.
Rufus B. Richardson,	Athens.
E. E. Salisbury,	New Haven.
Thomas D. Seymour,	New Haven.
A. D. White,	Ithaca, N.Y.

SECTION III.—6.

Political Economy and History.

Henry Adams,	Washington.
G. P. Fisher,	New Haven.
H. E. von Holst,	Chicago.
Henry C. Lea,	Philadelphia.
Henry M. Stevens,	Ithaca.
W. G. Sumner,	New Haven.

SECTION IV.—8.

Literature and the Fine Arts.

James B. Angell,	Ann Arbor, Mich.
L. P. di Cesnola,	New York.
H. H. Furness,	Wallingford, Pa.
R. S. Greenough,	Florence.
Augustus St. Gaudens,	New York.
John S. Sargent,	London.
E. C. Stedman,	Bronxville, N.Y.
W. R. Ware,	New York.

FOREIGN HONORARY MEMBERS.—69.

(Number limited to seventy-five. Elected as vacancies occur.)

CLASS I.—*Mathematical and Physical Sciences.*—23.

SECTION I.—7.

Mathematics and Astronomy.

Arthur Auwers,	Berlin.
George H. Darwin,	Cambridge.
H. A. E. A. Faye,	Paris.
Charles Hermite,	Paris.
Sir William Huggins,	London.
Otto Struve,	Karlsruhe.
H. C. Vogel,	Potsdam.

SECTION II.—6.

Physics.

Ludwig Boltzmann,	Vienna.
A. Cornu,	Paris.
Oliver Heaviside,	Newton Abbot.
F. Kohlrausch,	Berlin.
Lord Rayleigh,	Witham.
Sir G. G. Stokes, Bart.,	Cambridge.

SECTION III.—6.

Chemistry.

Adolf Baeyer,	Munich.
Marcellin Berthelot,	Paris.
J. H. van't Hoff,	Berlin.
D. Mendeleeff,	St. Petersburg.
Sir H. E. Roscoe,	London.
Julius Thomsen,	Copenhagen.

SECTION IV.—4.

Technology and Engineering.

Sir Benjamin Baker,	London.
Lord Kelvin,	Largs.
Maurice Lévy,	Paris.
William C. Unwin,	London.

CLASS II.—*Natural and Physiological Sciences.*—23.

SECTION I.—6.

Geology, Mineralogy, and Physics of the Globe.

Sir Archibald Geikie,	London.
Albert Heim,	Zurich.
Sir John Murray,	Edinburgh.
A. E. Nordenskiöld,	Stockholm.
Henry C. Sorby,	Sheffield.
Heinrich Wild,	Zurich.

SECTION II.—6.

Botany.

J. G. Agardh,	Lund.
E. Bornet,	Paris.
Sir Joseph D. Hooker,	Sunningdale.
W. Pfeffer,	Leipsic.
H. Graf zu Solms-Laubach,	Strassburg.
Eduard Strasburger,	Bonn.

SECTION III. — 7.

Zoölogy and Physiology.

Sir Michael Foster,	Cambridge.
Carl Gegenbauer,	Heidelberg.
Ludimar Hermann,	Königsberg.
A. von Kölliker,	Würzburg.
A. Kovalevsky,	St. Petersburg.
H. de Lacaze-Duthiers,	Paris.
Elias Metschnikoff,	Paris.

SECTION IV. — 4.

Medicine and Surgery.

W. Kühne,	Heidelberg.
Lord Lister,	London.
F. v. Recklinghausen,	Strassburg.
Rudolph Virchow,	Berlin.

CLASS III. — *Moral and Political Sciences.* — 23.

SECTION I. — 5.

Philosophy and Jurisprudence.

Heinrich Brunner,	Berlin.
F. W. Maitland,	Cambridge.
Sir Frederick Pollock,	
Bart.,	London.
Baron Russell of Kil-	
lowen,	Tadworth.
Henry Sidgwick,	Cambridge.

SECTION III. — 6.

Political Economy and History.

Duc de Broglie,	Paris.
James Bryce,	London.
Herman Grimm,	Berlin.
Theodor Mommsen,	Berlin.
William Stubbs,	Oxford.
Sir G. O. Trevelyan,	
Bart.,	London.

SECTION II. — 7.

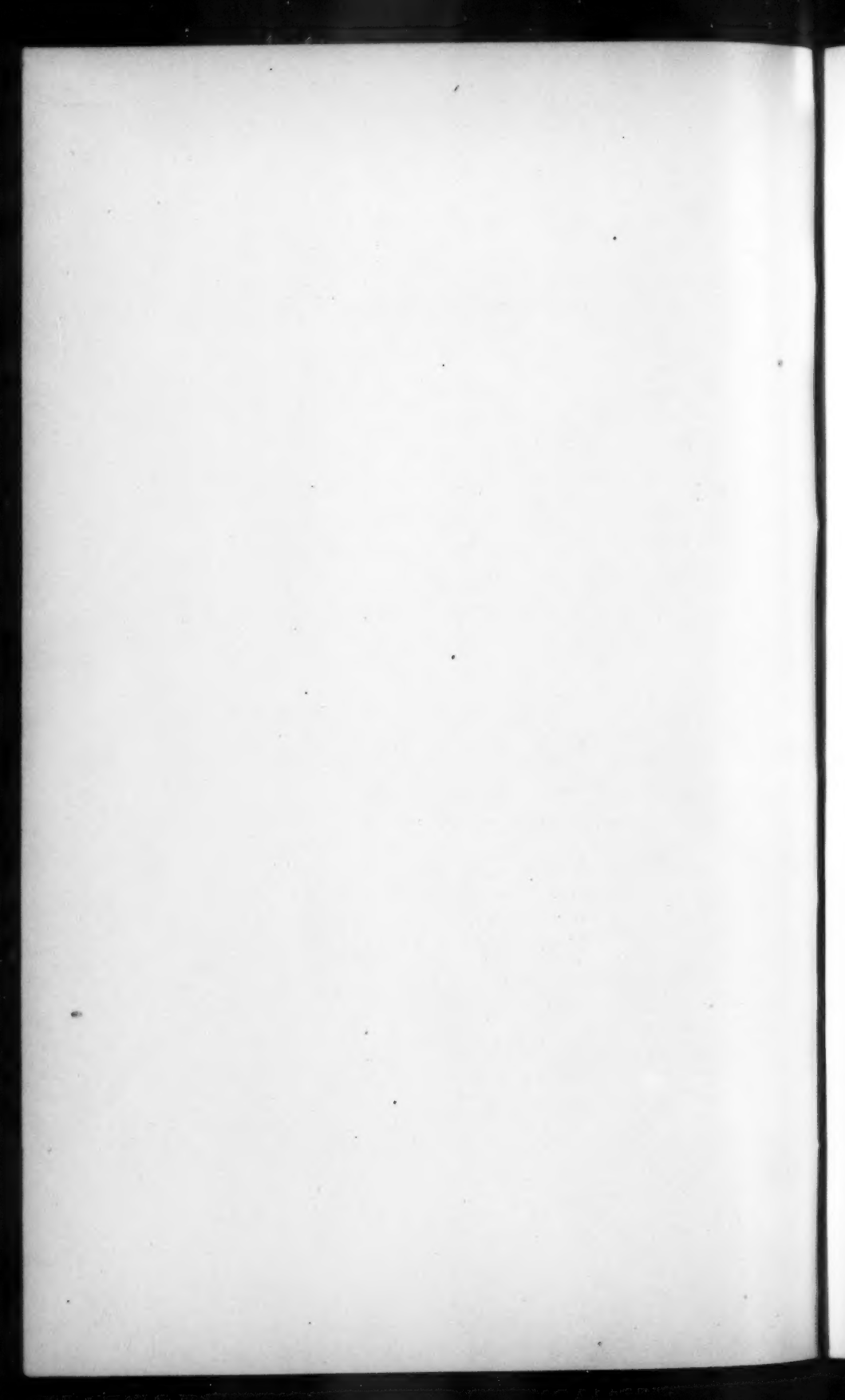
Philology and Archæology.

Ingram Bywater,	Oxford.
W. Dörpfeld,	Athens.
Sir John Evans,	Hemel Hempstead.
J. W. A. Kirchhoff,	Berlin.
G. C. C. Maspero,	Paris.
Max Müller,	Oxford.
Karl Weinhold,	Berlin.

SECTION IV. — 5.

Literature and the Fine Arts.

Georg Brandes,	Copenhagen.
F. Brunetière,	Paris.
Jean Léon Gérôme,	Paris.
Rudyard Kipling,	Rottingdean.
Leslie Stephen,	London.



STATUTES AND STANDING VOTES.

STATUTES.

Adopted May 30, 1854: amended September 8, 1857, November 12, 1862, May 24, 1864, November 9, 1870, May 27, 1873, January 26, 1876, June 16, 1886, October 8, 1890, January 11 and May 10, 1893, April 11, May 9, and October 10, 1894, and March 13, April 10, and May 8, 1895.

CHAPTER I.

OF FELLOWS AND FOREIGN HONORARY MEMBERS.

1. The Academy consists of *Fellows* and *Foreign Honorary Members*. They are arranged in three Classes, according to the Arts and Sciences in which they are severally proficient, viz.: Class I. The Mathematical and Physical Sciences; — Class II. The Natural and Physiological Sciences; — Class III. The Moral and Political Sciences. Each Class is divided into four Sections, viz.: Class I., Section 1. Mathematics and Astronomy; — Section 2. Physics; — Section 3. Chemistry; — Section 4. Technology and Engineering. Class II., Section 1. Geology, Mineralogy, and Physics of the Globe; — Section 2. Botany; — Section 3. Zoölogy and Physiology; — Section 4. Medicine and Surgery. Class III., Section 1. Philosophy and Jurisprudence; — Section 2. Philology and Archæology; — Section 3. Political Economy and History; — Section 4. Literature and the Fine Arts.

2. Fellows, resident in the State of Massachusetts, only, may vote at the meetings of the Academy.* Each Resident Fellow shall pay an admission fee of ten dollars and such annual assessment, not exceeding ten dollars, as shall be voted by the Academy at each Annual Meeting.

* The number of Resident Fellows is limited by the Charter to 200.

3. Fellows residing out of the State of Massachusetts shall be known and distinguished as Associate Fellows. They shall not be liable to the payment of any fees or annual dues, but on removing within the State shall be admitted to the privileges,* and be subject to the obligations, of Resident Fellows. The number of Associate Fellows shall not exceed *one hundred*, of whom there shall not be more than *forty* in either of the three Classes of the Academy.

4. The number of Foreign Honorary Members shall not exceed *seventy-five*; and they shall be chosen from among persons most eminent in foreign countries for their discoveries and attainments in either of the three departments of knowledge above enumerated. And there shall not be more than *thirty* Foreign Members in either of these departments.

CHAPTER II.

OF OFFICERS.

1. There shall be a President, three Vice-Presidents, one for each Class, a Corresponding Secretary, a Recording Secretary, a Treasurer, and a Librarian, which officers shall be annually elected, by ballot, at the Annual Meeting, on the second Wednesday in May.

2. At the same time, and in the same manner, nine Councillors shall be elected, three from each Class of the Academy, but the same Fellows shall not be eligible on more than three successive years. These nine Councillors, with the President, the three Vice-Presidents, the two Secretaries, the Treasurer, and the Librarian, shall constitute the Council. It shall be the duty of this Council to exercise a discreet supervision over all nominations and elections. With the consent of the Fellow interested, they shall have power to make transfers between the several Sections of the same Class, reporting their action to the Academy.

3. If any office shall become vacant during the year, the vacancy shall be filled by a new election, and at the next stated meeting, or at a meeting called for this purpose.

* Associate Fellows may attend, but cannot vote, at meetings of the Academy. See Chapter I. 2.

CHAPTER III.

OF NOMINATIONS OF OFFICERS.

1. At the stated meeting in March, the President shall appoint from the next retiring Councillors a Nominating Committee of three Fellows, one for each class.

2. It shall be the duty of this Nominating Committee to prepare a list of candidates for the offices of President, Vice-Presidents, Corresponding Secretary, Recording Secretary, Treasurer, Librarian, Councillors, and the Standing Committees which are chosen by ballot; and to cause this list to be sent by mail to all the Resident Fellows of the Academy not later than four weeks before the Annual Meeting.

3. Independent nominations for any office, signed by at least five Resident Fellows and received by the Recording Secretary not less than ten days before the Annual Meeting, shall be inserted in the call for the Annual Meeting, which shall then be issued not later than one week before that meeting.

4. The Recording Secretary shall prepare for use, in voting at the Annual Meeting, a ballot containing the names of all persons nominated for office under the conditions given above.

5. When an office is to be filled at any other time than at the Annual Meeting, the President shall appoint a Nominating Committee, in accordance with the provisions of Section 1, which shall announce its nomination in the manner prescribed in Section 2 at least two weeks before the time of election. Independent nominations, signed by at least five Resident Fellows and received by the Recording Secretary not later than one week before the meeting for election, shall be inserted in the call for that meeting.

CHAPTER IV.

OF THE PRESIDENT.

1. It shall be the duty of the President, and, in his absence, of the senior Vice-President present, or next officer in order as above enumerated, to preside at the meetings of the Academy; to summon extraordinary meetings, upon any urgent occasion; and to execute or see to the execution of the Statutes of the

Academy. Length of continuous membership in the Academy shall determine the seniority of the Vice-Presidents.

2. The President, or, in his absence, the next officer as above enumerated, is empowered to draw upon the Treasurer for such sums of money as the Academy shall direct. Bills presented on account of the Library, or the Publications of the Academy, must be previously approved by the respective committees on these departments.

3. The President, or, in his absence, the next officer as above enumerated, shall nominate members to serve on the different committees of the Academy which are not chosen by ballot.

4. Any deed or writing to which the common seal is to be affixed shall be signed and sealed by the President, when thereto authorized by the Academy.

CHAPTER V.

OF STANDING COMMITTEES.

1. At the Annual Meeting there shall be chosen the following Standing Committees, to serve for the year ensuing, viz. : —

2. The Committee of Finance, to consist of the President, Treasurer, and one Fellow chosen by ballot, who shall have charge of the investment and management of the funds and trusts of the Academy. The general appropriations for the expenditures of the Academy shall be moved by this Committee at the Annual Meeting, and all special appropriations from the general and publication funds shall be referred to or proposed by this Committee.

3. The Rumford Committee, of seven Fellows, to be chosen by ballot, who shall consider and report on all applications and claims for the Rumford Premium, also on all appropriations from the income of the Rumford Fund, and generally see to the due and proper execution of this trust.

4. The C. M. Warren Committee, of seven Fellows, to be chosen by ballot, who shall consider and report on all applications for appropriations from the income of the C. M. Warren Fund, and generally see to the due and proper execution of this trust.

5. The Committee of Publication, of three Fellows, to whom all memoirs submitted to the Academy shall be referred, and to

whom the printing of memoirs accepted for publication shall be intrusted.

6. The Committee on the Library, of three Fellows, who shall examine the Library, and make an annual report on its condition and management.

7. An Auditing Committee, of two Fellows, for auditing the accounts of the Treasurer.

CHAPTER VI.

OF THE SECRETARIES.

1. The Corresponding Secretary shall conduct the correspondence of the Academy, recording or making an entry of all letters written in its name, and preserving on file all letters which are received; and at each meeting he shall present the letters which have been addressed to the Academy since the last meeting. With the advice and consent of the President, he may effect exchanges with other scientific associations, and also distribute copies of the publications of the Academy among the Associate Fellows and Foreign Honorary Members, as shall be deemed expedient; making a report of his proceedings at the Annual Meeting. Under the direction of the Council for Nomination, he shall keep a list of the Fellows, Associate Fellows, and Foreign Honorary Members, arranged in their Classes and in Sections in respect to the special sciences in which they are severally proficient; and he shall act as secretary to the Council.

2. The Recording Secretary shall have charge of the Charter and Statute-book, journals, and all literary papers belonging to the Academy. He shall record the proceedings of the Academy at its meetings; and after each meeting is duly opened, he shall read the record of the preceding meeting. He shall notify the meetings of the Academy, and apprise committees of their appointment. He shall post up in the Hall a list of the persons nominated for election into the Academy; and when any individual is chosen, he shall insert in the record the names of the Fellows by whom he was nominated.

3. The two Secretaries, with the Chairman of the Committee of Publication, shall have authority to publish such of the proceedings of the Academy as as may seem to them calculated to promote the interests of science.

CHAPTER VII.

OF THE TREASURER.

1. The Treasurer shall give such security for the trust reposed in him as the Academy shall require.

2. He shall receive officially all moneys due or payable, and all bequests or donations made to the Academy, and by order of the President or presiding officer shall pay such sums as the Academy may direct. He shall keep an account of all receipts and expenditures; shall submit his accounts to the Auditing Committee; and shall report the same at the expiration of his term of office.

3. The Treasurer shall keep a separate account of the income and appropriation of the Rumford Fund, and report the same annually.

4. All moneys which there shall not be present occasion to expend shall be invested by the Treasurer, under the direction of the Finance Committee, on such securities as the Academy shall direct.

CHAPTER VIII.

OF THE LIBRARIAN AND LIBRARY.

1. It shall be the duty of the Librarian to take charge of the books, to keep a correct catalogue of same, and to provide for the delivery of books from the Library. He shall also have the custody of the publications of the Academy.

2. The Librarian, in conjunction with the Committee on the Library, shall have authority to expend, as they may deem expedient, such sums as may be appropriated, either from the Rumford or the General Fund of the Academy, for the purchase of books, and for defraying other necessary expenses connected with the Library. They shall have authority to propose rules and regulations concerning the circulation, return, and safe-keeping of books; and to appoint such agents for these purposes as they may think necessary.

3. To all books in the Library procured from the income of the Rumford Fund, the Librarian shall cause a stamp or label to be affixed, expressing the fact that they were so procured.

4. Every person who takes a book from the Library shall give a receipt for the same to the Librarian or his assistant.

5. Every book shall be returned in good order, regard being had to the necessary wear of the book with good usage. And if any book shall be lost or injured, the person to whom it stands charged shall replace it by a new volume or set, if it belongs to a set, or pay the current price of the volume or set to the Librarian; and thereupon the remainder of the set, if the volume belonged to a set, shall be delivered to the person so paying for the same.

6. All books shall be returned to the Library for examination at least one week before the Annual Meeting.

CHAPTER IX.

OF MEETINGS.

1. There shall be annually four stated meetings of the Academy; namely, on the second Wednesday in May (the Annual Meeting), on the second Wednesday in October, on the second Wednesday in January, and on the second Wednesday in March. At these meetings only, or at meetings adjourned from these and regularly notified, shall appropriations of money be made, or alterations of the statutes or standing votes of the Academy be effected.

2. Fifteen Fellows shall constitute a quorum for the transaction of business at a stated meeting. Seven Fellows shall be sufficient to constitute a meeting for scientific communications and discussions.

3. The Recording Secretary shall notify the meetings of the Academy to each Fellow residing in Boston and the vicinity; and he may cause the meetings to be advertised, whenever he deems such further notice to be needful.

CHAPTER X.

OF THE ELECTION OF FELLOWS AND HONORARY MEMBERS.

1. Elections shall be made by ballot, and only at stated meetings.

2. Candidates for election as Resident Fellows must be proposed by two or more Resident Fellows, in a recommendation signed by them, specifying the Section to which the nomination is made, which recommendation shall be transmitted to the Corresponding Secretary, and by him referred to the Council for Nomination. No person recommended shall be reported by the Council as a candidate for election, unless he shall have received a written approval, signed at a meeting of the Council by at least seven of its members. All nominations thus approved shall be read to the Academy at a stated meeting, and shall then stand on the nomination list during the interval between two stated meetings, and until the balloting. No person shall be elected a Resident Fellow, unless he shall have been resident in this Commonwealth one year next preceding his election. If any person elected a Resident Fellow shall neglect for one year to pay his admission fee, his election shall be void; and if any Resident Fellow shall neglect to pay his annual assessments for two years, provided that his attention shall have been called to this article, he shall be deemed to have abandoned his Fellowship; but it shall be in the power of the Treasurer, with the consent of the Council, to dispense (*sub silentio*) with the payment both of the admission fee and of the assessments, whenever in any special instance he shall think it advisable so to do.

3. The nomination of Associate Fellows shall take place in the manner prescribed in reference to Resident Fellows; and after such nomination shall have been publicly read at a stated meeting previous to that when the balloting takes place, it shall be referred to the Council for Nomination; and a written approval, authorized and signed at a meeting of said Council by at least seven of its members, shall be requisite to entitle the candidate to be balloted for. The Council may in like manner originate nominations of Associate Fellows, which must be read at a stated meeting previous to the election, and be exposed on the nomination list during the interval.

4. Foreign Honorary Members shall be chosen only after a nomination made at a meeting of the Council, signed at the time by at least seven of its members, and read at a stated meeting previous to that on which the balloting takes place.

5. Three fourths of the ballots cast must be affirmative, and the number of affirmative ballots must amount to eleven to effect an election of Fellows or Foreign Honorary Members.

6. Each Section of the Academy is empowered to present lists of persons deemed best qualified to fill vacancies occurring in the number of Foreign Honorary Members or Associate Fellows allotted to it; and such lists, after being read at a stated meeting, shall be referred to the Council for Nomination.

7. If, in the opinion of a majority of the entire Council, any Fellow — Resident or Associate — shall have rendered himself unworthy of a place in the Academy, the Council shall recommend to the Academy the termination of his Fellowship; and provided that a majority of two thirds of the Fellows at a stated meeting, consisting of not less than fifty Fellows, shall adopt this recommendation, his name shall be stricken off the roll of Fellows.

CHAPTER XI.

OF AMENDMENTS OF THE STATUTES.

1. All proposed alterations of the Statutes, or additions to them, shall be referred to a committee, and, on their report at a subsequent meeting, shall require for enactment a majority of two thirds of the members present, and at least eighteen affirmative votes.

2. Standing Votes may be passed, amended, or rescinded, at any stated meeting, by a majority of two thirds of the members present. They may be suspended by a unanimous vote.

CHAPTER XII.

OF LITERARY PERFORMANCES.

1. The Academy will not express its judgment on literary or scientific memoirs or performances submitted to it, or included in its publications.

STANDING VOTES.

1. Communications of which notice had been given to the Secretary shall take precedence of those not so notified.

2. Resident Fellows who have paid all fees and dues chargeable to them are entitled to receive one copy of each volume or article printed by the Academy, on application to the Librarian personally or by written order, within two years from the date of publication. And the current issues of the Proceedings shall be supplied, when ready for publication, free of charge, to all the Fellows and members of the Academy who desire to receive them.

3. The Committee of Publication shall fix from time to time the price at which the publications of the Academy may be sold. But members may be supplied at half this price with volumes which they are not entitled to receive free, and which are needed to complete their sets.

4. Two hundred extra copies of each paper accepted for publication in the Memoirs or Proceedings of the Academy shall be placed at the disposal of the author, free of charge.

5. Resident Fellows may borrow and have out from the Library six volumes at any one time, and may retain the same for three months, and no longer.

6. Upon special application, and for adequate reasons assigned, the Librarian may permit a larger number of volumes, not exceeding twelve, to be drawn from the Library for a limited period.

7. Works published in numbers, when unbound, shall not be taken from the Hall of the Academy, except by special leave of the Librarian.

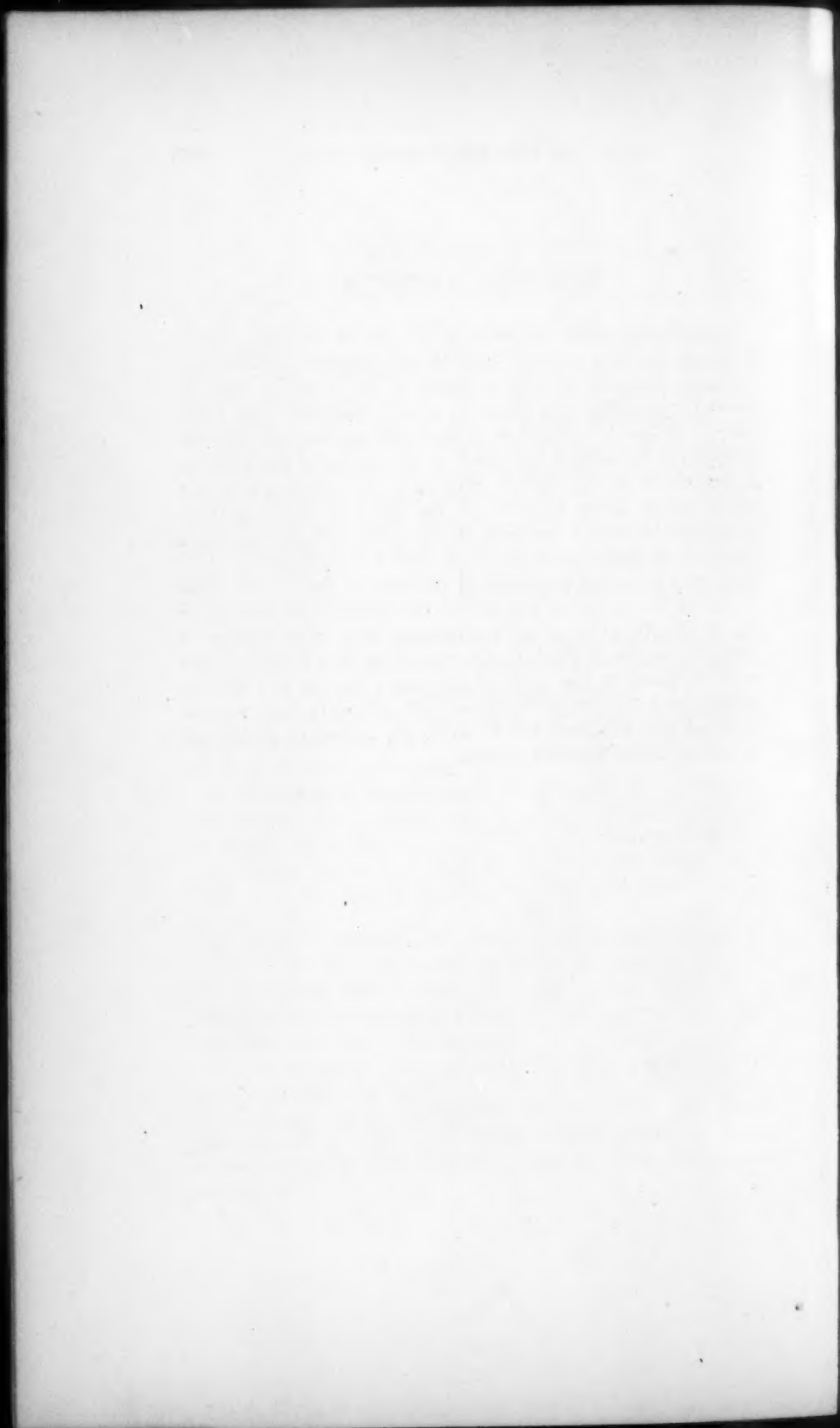
8. Books, publications, or apparatus shall be procured from the income of the Rumford Fund only on the certificate of the Rumford Committee that they, in their opinion, will best facilitate and encourage the making of discoveries and improvements which may merit the Rumford Premium.

9. The Annual Meeting and the other stated meetings shall be holden at eight o'clock, P. M.

10. A meeting for receiving and discussing scientific communications may be held on the second Wednesday of each month not appointed for stated meetings, excepting July, August, and September.

RUMFORD PREMIUM.

In conformity with the terms of the gift of Benjamin, Count Rumford, granting a certain fund to the American Academy of Arts and Sciences, and with a decree of the Supreme Judicial Court for carrying into effect the general charitable intent and purpose of Count Rumford, as expressed in his letter of gift, the Academy is empowered to make from the income of said fund, as it now exists, at any Annual Meeting, an award of a gold and silver medal, being together of the intrinsic value of three hundred dollars, as a premium to the author of any important discovery or useful improvement in light or in heat, which shall have been made and published by printing, or in any way made known to the public, in any part of the continent of America, or any of the American islands; preference being always given to such discoveries as shall, in the opinion of the Academy, tend most to promote the good of mankind; and to add to such medals, as a further premium for such discovery and improvement, if the Academy see fit so to do, a sum of money not exceeding three hundred dollars.



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